

Are Risk Preferences Shaped by Status Concerns?*

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Abstract

We embed an experiment in a large-scale representative survey to investigate the impact of status concerns on the willingness to take risks. While we show that concerns about relative standing in the wealth distribution motivate risk-taking, our results contest the common prediction of higher risk-taking in the middle of the distribution. Instead, we find that respondents who are induced to perceive their relative wealth as low display more tolerance towards risk in a subsequent incentivized lottery task. This effect is not uniform but is mainly driven by individuals who more firmly believe that life outcomes are beyond their control.

Keywords: relative wealth, risk preferences, survey experiment, locus of control

JEL classification numbers: C93, D31, D81, D91, E21

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1 Introduction

This paper investigates how status concerns affect a person’s risk-taking behavior and whether this effect varies as a function of their perceived control over life outcomes. Relative consumption and relative wealth are essential components of well-being and are inevitably intertwined with a person’s willingness to take risks.¹ Intuitively, a person’s concern about their status in the wealth distribution should motivate risk-taking when there is a chance to improve one’s relative standing, even if this improvement is minimal (Friedman and Savage, 1948). Recent theoretical work made progress in modeling this relationship by explicitly incorporating considerations for status and rank into the utility function.² Most of this work confirms the Friedman-Savage conjecture that risk-taking mainly occurs in the middle of the distribution where status gains are likely substantial (Robson, 1996; Becker et al., 2005; Ray and Robson, 2012). Newer work, on the other hand, predicts that risk-taking happens at the bottom of the distribution, where rewards from risk-taking are steep (Kuziemko et al., 2014; Hopkins, 2018).

This impact of status concerns on risk-taking behavior likely varies based on individual differences in the perceptions of how behavior influences outcomes. People have markedly different beliefs in the causes of life outcomes, like their wealth; some attribute these outcomes to their actions, while others to luck or fate. Beyond their relevance for inequality and fairness attitudes (Alesina and Angeletos, 2005; Almås et al., 2020; Fehr and Vollmann, 2022), evidence from the World Value Survey indicates that the relationship between risk-taking and inequality varies as a function of these beliefs. Moreover, psychological studies consistently show a link between an individual’s perceived ability to control life outcomes and one’s interest in relative comparisons (e.g., Testa and Major, 1990; Aspinwall and Taylor, 1993; Buunk and Gibbons, 2007; Fiske, 2011). Accordingly, it is natural to ask how the response to status concerns depends on individual-specific beliefs about the underlying structural causes of relative wealth.

We present field evidence of the causal link from relative wealth to risk-taking and of the psychological underpinning of this relationship. We face two major empirical challenges in credibly testing this link in the field. First, varying levels of risk aversion are likely to result in fundamentally

¹A voluminous literature, dating back at least to Veblen (1899) and Duesenberry (1949), has accumulated evidence that people care not only about absolute outcomes but also their relative position. See for example, Frank (1985); Abel (1990); Gali (1994); Carroll et al. (2000); Ljungqvist and Uhlig (2000); Hopkins and Kornienko (2004); Luttmer (2005); Fliessbach et al. (2007); Card et al. (2012); Cohn et al. (2014); Perez-Truglia (2020); Coibion et al. (2020); Roth (2023).

²In an early attempt to rationalize why people are both willing to buy lottery tickets and insurance plans, Friedman and Savage (1948) proposed a relationship with status concerns and constructed a utility function with concave and convex parts, such that large enough gambles might induce people to accept risk to move up in the wealth distribution. Gregory (1980) has illustrated how relative comparisons can rationalize Friedman and Savage’s argument.

different wealth accumulation outcomes to begin with. Second, it is difficult, if not impossible, to create exogenous variation in relative wealth. We address these challenges by designing and implementing a survey module in a representative longitudinal study of the German population (Socio-Economic Panel – SOEP). This tailor-made survey module includes a pre-treatment measure of the perceived ability to control life outcomes and a randomized manipulation of relative wealth perceptions. In addition, we measure risk-taking behavior with an incentivized lottery task that is easy to understand and sufficiently rich to parameterize an individual’s utility function. This setup allows us to integrate respondents’ background wealth into our manipulation of relative wealth and to meaningfully examine the heterogeneous influence of perceptions of control.

Our strategy to create the necessary exogenous variation in relative wealth is to induce a shift in respondents’ *perceived* relative standing in the wealth distribution. To do so, we take advantage of the fact that most people have to infer their relative wealth rank from their limited information on the distribution of income and wealth and systematically misestimate their rank.³ We ask respondents about their net wealth and randomly assign half of the respondents to response categories with wide intervals, e.g., the lowest category ranges up to the 80th percentile of the German net wealth distribution (treatment condition). The other half of respondents receive response categories with small intervals, with the lowest category ranging up to the 20th percentile and the highest category starting at the 60th percentile (control condition). To illustrate the underlying idea, consider, for example, a group of respondents with the same objective wealth level that would place them into the 60th percentile. Respondents in the control condition would end up in the highest category, whereas respondents in the treatment condition would end up in the lowest category. Consequently, the randomization of response categories ensures that the objective income and wealth distribution is the same across treatment and control, while inducing respondents to feel that their wealth is at the lower end of the distribution and further away from the top. We think of this exogenous variation in perceived relative standing as a tool to isolate a temporary change in risk-taking that helps us to illustrate the theoretical linkage between status concerns and risk preferences.

The “first stage” shows that the wider wealth intervals in the treatment condition led the overwhelming majority of respondents to locate themselves at the lower end of the distribution

³Evidence, for example for the US, suggests that individuals have limited knowledge about the wealth distribution and systematically underestimate wealth inequality (Norton and Ariely, 2011). Related, people tend to underestimate their relative income rank nationally and globally but adjust these beliefs in response to information about their actual ranks (e.g., Cruces et al., 2013; Karadja et al., 2017; Fehr et al., 2022b,a).

and perceive a more significant gap to the top, as intended. Focusing on relative income to minimize possible anchoring and demand effects, we show that treated respondents estimate a 29 percent higher household income threshold for being richer than 90 percent of others compared to non-treated respondents. We complement this first-stage evidence with a manipulation check using a different study sample to show that the intervention affects relative wealth perceptions but not other perceptions and affective states. This additional exercise demonstrates that treated respondents think they rank lower in the wealth distribution than non-treated respondents (and are thus less affluent than others) and that the treatment shifts the perceived wealth level at the top but not in the middle of the distribution. Moreover, we are able to rule out alternative mechanisms through which our treatment may affect risk-taking, such as short-term fluctuations in emotions and absolute wealth perceptions. Together, this presents strong evidence that the treatment solely shifts perceptions of relative standing in the wealth distribution.

We present two main findings. First, our treatment results in a sizeable reduction of risk aversion. The likelihood of choosing a risky option instead of the safe option is 22 percent higher when respondents are induced to perceive their relative standing as low. This lower aversion to risk can result in a higher propensity to consume in the short run and improve one's relative standing. To provide a more straightforward interpretation in terms of risk aversion, we then estimate individual-level utility function parameters assuming constant relative risk aversion (CRRA) as is standard in the literature. The estimated CRRA parameter ρ is about 0.5 lower among treated respondents, corresponding to a shift of 19 percent relative to the control group mean and implying less risk aversion.

Second, the response to status concerns is heterogeneous and depends on respondents' perceptions about their control over life outcomes, that is, their locus of control (Rotter, 1966). We first present direct evidence on the relationship between locus of control (LoC) and interest in relative comparisons using data from the SOEP. In line with previous psychological research, we find that individuals perceiving less control over life outcomes — characterized by an *external* locus of control — show greater interest in making relative comparisons. This partly reflects that external people may derive more utility from favorable comparisons than internal people, who enjoy better outcomes in other domains of life and are thus less dependent on favorable relative comparisons than externals (see e.g., Clark and Senik, 2010).⁴

⁴Growing evidence suggests that a stronger belief in control over life is, like other non-cognitive skills, strongly associated with better life outcomes, such as better subjective health, life satisfaction, educational attainment, and labor market outcomes (Coleman and DeLeire, 2003; Heckman et al., 2006; Barón and Cobb-Clark, 2010; Heckman and Kautz,

We then show that respondents who are more inclined to believe that life outcomes are a matter of luck and fate substantially increase their risk-taking behavior. The effect is sizable, with a one standard deviation increase in external control beliefs shifting the estimated risk parameter ρ by an additional 0.9 towards less risk aversion. This finding aligns with our evidence from the World Value Survey, showing that perceptions of lower control reinforce the negative relationship between income inequality and risk aversion. We are able to address a host of alternative explanations for this result. In particular, we find no evidence that locus of control merely picks up other facets of personal characteristics. Personality traits (Big 5, self-control, and optimism), emotions, and socio-demographic characteristics do not moderate the observed relationship.

Contribution and Related Literature. The study contributes to several strands of the literature. Most importantly, we provide field evidence on the competing predictions of the theories of status and risk-taking and, in particular, examine the psychological underpinnings of status concerns. Our findings challenge the theoretical predictions in the tradition of Friedman and Savage (1948) and instead suggest a higher concentration of risk-taking at the lower end of the distribution (see, e.g., Kuziemko et al., 2014; Hopkins, 2018). In these models, higher risk-taking derives from a disutility of being in the last place (Kuziemko et al., 2014) or from competition for societal rewards that are allocated according to spending on conspicuous consumption (Hopkins, 2018). Common to these and other models of status concerns and risk-taking is that they only consider objective status and implicitly assume that people know their position in the wealth distribution. In contrast to these models, the causal mechanism in our setting works through perceived relative standing. Consequently, the effects we observe are more general than those proposed by the models: we observe more risk-taking along a large part of the distribution as long as people perceive their relative standing as low. The attractiveness of risk-taking in this case is, however, not uniform but depends on enduring and individual-specific dispositions of control over life outcomes. From a practical perspective, these findings are important as stakeholders, such as lobbyists, political parties, and policymakers, are often interested in influencing people's perceptions of reality to increase support for their agenda. Our results suggest that any public discourses about policies affecting people's perceived relative standing could be tweaked, thus fundamentally influencing the economic decision-making of individuals.

On the empirical side, there are a handful of studies on social comparison and risk-taking

2012; Becker et al., 2012; Cobb-Clark, 2015; Caliendo et al., 2015; Pinger et al., 2018; Caliendo et al., 2022).

in small-scale laboratory and lab-in-the-field settings (Kuziemko et al., 2014; Fafchamps et al., 2015; Dijk, 2017; Gamba et al., 2017; Kirchler et al., 2018; Schwerter, 2023).⁵ These experiments typically let subjects make risky decisions involving their lab endowment and randomly vary whether the earnings of other subjects or one's relative ranking are observed or not. While this stimulates social comparisons, it tightly links the nature of the social comparison to the outcomes of the risk preferences elicitation task. Our research advances beyond this existing literature on social comparisons by providing evidence from naturally emerging social comparisons in a large representative sample. We can strictly separate the risk task from manipulating perceived relative standing by embedding our treatment into a simple question about background household wealth and thus avoid the reliance on randomly assigned income rank or forced comparisons.⁶ This enhances our understanding of the importance of status concerns in a real-world setting where such concerns emerge organically and likely vary in strength depending on individual-specific beliefs.

The latter issue ties into recent efforts to incorporate personality traits into economic analysis with greater rigor (Borghans et al., 2008; Almlund et al., 2011; Becker et al., 2012; Heckman et al., 2021; Jagelka, forthcoming). Most of this emerging literature focuses on personality traits such as the Big 5, while LoC has received comparatively less attention despite its strong association with important life outcomes. We focus on the relevance of LoC in influencing the strength of status concerns, and the observed heterogeneity in this strength highlights how psychological primitives can have a bearing on risk preferences.

More broadly, our study contributes to a growing literature on the origins of risk preferences. This literature has, for example, focused on the lasting effects of aperiodic personal experiences such as natural disasters (e.g., Eckel et al., 2009; Cameron and Shah, 2015; Hanaoka et al., 2018), macroeconomic crises (e.g., Malmendier and Nagel, 2011; Cohn et al., 2015) or violence (e.g., Voors et al., 2012; Callen et al., 2014; Jakiela and Ozier, 2019; Brown et al., 2019) on risk preferences. A few other studies investigate short-term fluctuations in attitudes towards risk that are triggered by reoccurring economic and psychological phenomena such as day-to-day income fluctuations

⁵The study also relates to a growing literature on aspirations (see La Ferrara 2019, and Genicot and Ray 2020, for reviews). Aspirations are relative in nature, as comparisons to others significantly inform individual desires and goals. In this sense, aspirations and reference points may encourage risk-taking (Ray and Robson, 2012; Genicot and Ray, 2020; Dohmen et al., 2021; Alaoui and Penta, 2022; Pickard et al., 2023).

⁶In this way, our experimental design is related to Haisley et al. (2008). They studied a small sample of low-income people at a Greyhound Bus Station and found that they are more inclined to buy lottery tickets if they are primed to think that their relative income is low.

(Akesaka et al., 2023) and emotions (Meier, 2022).⁷ Our study places in between these two lines of research. We complement the literature on violence, crisis, and disaster by explicitly focusing on the impact of a more familiar and natural experience, namely the relative position of individuals in the economic hierarchy of society. To the extent that relative comparisons are frequent, their impact on choices is less transient than, for example, the impact of emotional states.

2 Research Design

We run our study in the German Socio-Economic Panel (SOEP), a nationally representative longitudinal study of German households (see Goebel et al., 2018, for more details). The SOEP includes an Innovation Sample (SOEP-IS) comprising several independent and representative samples. Researchers can propose their own modules in one or more of these samples. Participating households in the SOEP-IS are surveyed yearly, and all household members above age 16 are interviewed in computer-assisted face-to-face interviews by professional interviewers. This has unique advantages over other frequently used survey modes (e.g., phone and online surveys), as it minimizes non-response and misunderstandings and prevents information look-up and communication within households (for more detailed information, see Richter and Schupp, 2015).

2.1 Design of the Survey Module and Measures

We implemented a tailor-made survey module in the 2017 wave of the SOEP-IS. When we started designing the experiment in 2016, pre-registration was not widely adopted outside of development economics (for example, in the AEA RCT Registry, less than 10 percent of all registered RCTs were registered before 07/2016).⁸ It is, however, important to note that we explicitly designed the survey module to investigate average and heterogeneous treatment effects, as discussed below, and that the sample size was pre-determined by the existing panel structure of the SOEP. Our tailor-made survey module consists of three parts: questions on locus of control, treatment manipulation, and an incentivized lottery task to measure risk preferences (see the Appendix for the full details of the survey module).

⁷See Chuang and Schechter (2015) and Schildberg-Hörisch (2018) for a recent review of the literature on variation in (risk) preferences over time.

⁸See registrations in the AEA RCT Registry (2013-05-15 through 2023-11-01) <https://doi.org/10.7910/DVN/8YNXVW>. We registered the study ex-post for research transparency as encouraged by the American Economic Association (AEARCTR-0007444).

Locus of Control. In the first part of our survey module, we elicit our personality construct of interest, locus of control (LoC), which expresses the extent to which someone believes that life events are under their control (Rotter, 1966). LoC forms early in life and has a significant degree of short- and medium-term stability (Cobb-Clark and Schurer, 2013; Fitzenberger et al., 2021). We implemented the same ten routinely used items in the SOEP (Nolte et al., 1997). For each item, respondents had to agree or disagree with statements such as “*the course of my life is depending on me*” and “*which opportunities I have in life is determined by social conditions*”, using a Likert-scale ranging from 1 (disagree completely) to 7 (agree completely).⁹ Because greater perceived control is typically associated with a more optimistic outlook, we will control for optimism (Lerner and Keltner, 2001). We measure optimism with two questions: a general question about optimism regarding the future (on a 4-point scale) taken from the SOEP and a question about the likelihood of experiencing specific events, such as financial gains, career success, or illness, relative to an average person (on a 7-point scale). Following prior studies (Specht et al., 2013; Cobb-Clark and Schurer, 2013), we use the unweighted average of seven of the ten items of our LoC measure as a single index for LoC beliefs. Each item is coded such that higher values correspond to a more external LoC. It is important to note that LoC is a continuum and that the overwhelming majority of respondents fall between the two extremes (see Figure A1 for the distribution of LoC).

Treatment Manipulation. The second part contains our treatment manipulation. We aim to induce variation in the perceived relative standing in the wealth distribution by asking respondents about their net wealth and varying the response scale of the question. This manipulation builds on research showing that response scales inevitably carry information about the population distribution. In particular, psychological and survey research suggests that respondents use their location on the scale to determine their place in the distribution (e.g., Schwarz et al., 1985; Rockwood et al., 1997; Menon et al., 1997; Bertrand and Mullainathan, 2001).

We explain the concept of net wealth and ask respondents to indicate their net wealth using five predefined wealth categories. We randomly vary the range of available response categories (see Table 1). Half of the respondents receive categories with wide intervals (treatment condition), i.e., *less than €275,000; €275,001 to €468,000; €468,001 to €722,000; €722,001 to €989,000; more than €989,000*. The other half of respondents are assigned to the control condition with much smaller intervals, i.e., *less than €2,500; €2,501 to €11,000; €11,001 to €27,000; €27,001 to €112,000;*

⁹For an overview over the wording of each item and the construction of the LoC scale, see Table A1.

more than €112,000. We constructed the intervals based on the most recent data on the German wealth distribution at the time of the survey.¹⁰ The lowest interval in the treatment condition covers 80 percent of the German net wealth distribution, implying that most respondents should locate themselves at the lower end of the wealth distribution. In contrast, the responses in the control condition should be more concentrated in the middle and top categories.

Risk-Elicitation Task. After the wealth categorization, respondents participate in a risk-preference elicitation task. We use a choice set that requires respondents to make a single choice from a set of six gambles (Binswanger, 1980; Eckel and Grossman, 2002). Each gamble has an equal chance of yielding a low or a high payoff. While the first gamble guarantees respondents a payoff of € 50, the remaining gambles gradually decrease the low payoff and increase the high payoff (see Table A2). The lotteries gradually increase in expected value but also in the implicit level of risk (standard deviation). This task is easy to understand and, therefore, well suited for eliciting risk preferences in a general population sample (Dave et al., 2010; Charness et al., 2013), yet still rich enough to obtain detailed utility information.¹¹ We incentivized the task by randomly selecting one in ten respondents and paying them the outcome of their chosen gamble.

Discussion of the Design. Our design relies on a shift in perceived relative standing in the wealth distribution to identify the causal link from relative wealth to risk-taking. A common aspect of this type of variation is that changes in perceptions *and* behavior are rather short-lived (e.g., Cavallo et al., 2017; Bottan and Perez-Truglia, 2022).¹² However, this is sufficient for our purpose as the theoretical models are agnostic about the temporal implications of status concerns, and we are primarily interested in isolating the causal relationship between status concerns and risk-taking, as proposed in these models.

In addition, the treatment manipulation offers other advantages that are worth highlighting. First, we intentionally use a subtle manipulation and abstain from providing more explicit information about wealth ranks to minimize the risk of inducing experimenter demand effects (Haaland

¹⁰The upper bounds of the intervals correspond to the 20th, 30th, 40th, and 60th percentile of the distribution in the control condition and the 80th, 90th, 95th, and 97th percentile in the treatment condition. The median net wealth in 2014 was 60,400 euros, while the average was 214,500 (see HFCS, Deutsche Bundesbank, 2016, for more information).

¹¹A comprehension check after the risk elicitation task revealed that about 89 percent of respondents rated the comprehensibility of the risk-elicitation task as good or very good, and only 2 percent of respondents as insufficient or unintelligible.

¹²The pass-through rate of information on beliefs is typically substantially lower than the Bayesian benchmark and fades out within a short time frame. Given that effect sizes of behavior are usually smaller than effect sizes on belief updating, we do not expect that changes in risk-taking are permanent (see Haaland et al., 2023, for a review).

et al., 2023). Second, the random assignment to the two conditions ensures that, in expectation, the actual distribution of income and wealth is the same in both groups, thus keeping absolute wealth levels constant. Third, respondents receive information about the wealth distribution in the control and treatment groups. Consequently, the treatment variation comes from differences in this information and is orthogonal to prior perceptions about relative wealth and other unobserved and observed individual characteristics. This is also important for analyzing heterogeneity in LoC as perceived relative wealth may depend on individual characteristics (such as LoC). To analyze this heterogeneity, we deliberately placed the elicitation of LoC before the treatment. This avoids running the risk that imbalances in LoC drive the results and rules out the possibility that the treatment influences responses to the LoC questions.

2.2 Data

Setting and Implementation. We implemented our survey module in the 2017 wave of the SOEP-IS, which consisted of 1,115 individuals (Sample I3). Our study requires that respondents participate in the risk-preference elicitation task. Because respondents could refuse to do so, we included only respondents with non-missing observations, resulting in 914 observations. Importantly, missing observations are not more likely to appear in either of the two treatment conditions (17 percent in the control and 20 percent in the treatment condition, t-test, $p=0.20$).¹³ In Section 4.3, we provide further evidence that there is no differential selection into the risk elicitation task and that our results are robust to re-weighting the study sample to match the socio-economic characteristics of the entire sample.

Covariates. We consider a set of observables that have been shown to relate to risk aversion, including age, gender, education, parent’s education, marital status, household size, employment status, satisfaction with health and life, region (East/West Germany), income, and wealth (see Dohmen et al., 2011). Education is measured by the highest degree or diploma, taking into account schooling, vocational training, and university education, while the educational background of both parents is proxied by the eligibility for attending university (a completed *Abitur*).¹⁴ To measure a respondent’s objective wealth, we use household information on assets and housing to estimate

¹³Respondents could not condition their participation on the lottery stakes because they only received some general explanation of the elicitation task before they had to indicate their participation decision.

¹⁴We use this scheme instead of years of schooling because of the early tracking in German schools the same years of schooling do not necessarily mean the same level of educational attainment.

household wealth, following Fuchs-Schündeln and Schündeln (2005). As a proxy for wealth, we also consider homeownership, which is the most important component of wealth in Germany below the top 1% of the wealth distribution (Schröder et al., 2020). Finally, we also control for baseline risk aversion using a qualitative measure of general risk aversion measured on a scale from 0 to 10 (very willing to not willing to take risks) before the treatment.

Balance. In Table A3, we present p-values from a set of linear regressions assessing the balance of observables by treatment status. The results of these regressions (including an F-test for joint significance of all variables) indicate that the treatment and control groups are very similar along these observables. Nevertheless, we will show all empirical results with and without covariates. Finally, in Table A4, we present the same exercise for LoC and other personality traits. Again, the table indicates that these traits are well-balanced across the treatment and control groups.

Manipulation Check. We conducted a manipulation check to illustrate through which channel our intervention affects risk-taking. For this purpose, we recruited a new sample ($N = 987$) through respondi, an internationally well-known panel provider, since we could only implement some basic tests in the SOEP-IS (see Section A.2 for more implementation details). We implemented a short survey (median duration six minutes) with the exact same treatment intervention and measured its impact on the perceived rank in the wealth distribution, median and top-income levels, LoC, positive and negative affective states, and credibility of the wealth data.

3 First Stage Results and Manipulation Check

First Stage. We start our analysis with a closer look at the “first stage” of our intervention and examine whether it induced a feeling of low relative wealth and of being further away from the top. As a first step, we show the responses to the wealth categorization in both conditions in Table 1. The treatment manipulation successfully sorted respondents into the different wealth categories, as intended. In the control condition, the distribution of responses in the five wealth categories is well dispersed, and a majority of respondents aligned themselves in one of the three top categories starting from € 11,000. In strong contrast, about 80 percent of respondents in the treatment condition placed themselves in the lowest category. Accordingly, the wider wealth intervals of the treatment condition induced most respondents to locate themselves at the lower end of the wealth distribution.

Respondents' categorizations are also reflected in their absolute wealth. For example, the average wealth in the lowest treatment category (ranging to the 80th percentile) is about €127,000, comparable to the average wealth of €126,000 in the four lowest control categories that range up to the 60th percentile. Similarly, the average wealth in the highest control category is close to the level in the four highest treatment categories (€427,000 vs. €370,000).¹⁵ This alignment of sorting in absolute wealth across conditions in our data implies that respondents do have a quite accurate assessment of their own absolute level of wealth. Thus, our treatment manipulation is unlikely to affect perceptions of absolute wealth.

The second step is to see whether the treatment successfully induced a feeling of a low relative standing and a larger gap to the top. To minimize concerns about demand effects and anchoring, we deliberately focused on respondents' perceptions about the relative income distribution and placed the question in a subsequent and unrelated survey module.¹⁶ We ask respondents to estimate the household income above which they are richer than 90 percent of other households. Suppose the treatment successfully induced a perception of lower relative standing in the wealth distribution. In that case, we should expect a similar qualitative effect on this relative income estimate, given the positive correlation between wealth and income. That is, inferring the 90th income percentile based on own income should result in higher estimates in the treatment condition, indicating a larger perceived gap to the top. Column (1) of Table 2 confirms this hypothesis and indicates a strong effect: treated respondents estimate that the 90th percentile in the household income distribution is 29 percent higher compared to what untreated respondents think.

Manipulation Check. We complement these first-stage results with a manipulation check to provide more direct evidence of how our intervention affects behavior. We show that the treatment influences how respondents perceive the overall wealth level (i.e., the median and 90th wealth percentile) and their relative position in the wealth distribution. Columns 2–4 in Table 2 show the results from this exercise. First, the estimates for the net wealth at the median and 90th percentile are higher among treated respondents (columns 2 and 3). However, the effect on the 90th percentile is substantially more pronounced and significant, implying that treated respondents perceive an asymmetric shift in the distribution at the upper end. Second, and most importantly, the treatment

¹⁵We see a similar pattern if we look at homeownership as a proxy for wealth, which is not surprising given the strong correlation between wealth and homeownership ($\rho = 0.58$).

¹⁶Both measures should alleviate concerns that the “first stage” merely reflects numerical anchoring effects (or demand effects) because it is assumed that anchoring is a short-lived phenomenon and the treatment targeted relative wealth standing for which the exact quantitative mapping from wealth to income figures is non-trivial.

has an effect on relative rank perceptions. When asked how their wealth situation compares to other German households, only 22 percent of treated respondents say it is better or much better (compared to 30 percent in the control condition, t-test, $p < 0.01$). In the last column of Table 2, we quantify this assessment and show how respondents compare their net wealth to other households: treated respondents think they rank significantly lower in the wealth distribution than non-treated respondents and thus perceive themselves as poorer. These findings further illustrate that the intervention affects relative wealth perceptions but not absolute wealth perceptions.

The manipulation check also allows us to rule out other channels through which the intervention may influence risk-taking. First, we show that respondents find the presentation of wealth categories credible in both treatment and control groups. We see virtually no difference in the credibility rating of the presented wealth data (see Table A6, column 1). Second, we test whether status concerns have a bearing on respondents' LoC. We find no evidence for such an effect: treated respondents display a similar level of LoC as respondents in the control group (Table A6, column 2). Finally, we address a concern that the treatment induces a temporary change in emotional states, for example, because one learns that one's wealth is at the lower end of the distribution. We examine the impact of our treatment on two different positive and negative affective states – self-esteem and mood – and on limitations due to emotional problems. We find no indication that the feeling of low relative standing results in changes in these affective states and limitations (Table A6, columns 3–5).

In summary, we take these results as evidence that exposing respondents to wider wealth intervals in the treatment condition generated a very strong “first stage” and had the intended effect of significantly shifting respondents' views about whether their relative standing in the wealth distribution is low or not.

4 Main Results

4.1 Average Treatment Effect

We now analyze how perceived relative standing in the wealth distribution impacts respondents' willingness to take risks. The incentivized lottery task allows us to estimate preference parameters under reasonable assumptions. It is common in the literature to assume that people view the financial gains of these incentivized lotteries in isolation and do not integrate their background wealth when making their choice (e.g., Andersen et al., 2008), since otherwise, their choices in small-stakes lotteries would imply implausible levels of risk-aversion (Rabin, 2000). Theoretically, we can

rationalize this assumption by separating short-term consumption budgets from background wealth in a dual-self model, in which agents evaluate (lottery) choices relative to short-term consumption and not wealth (Fudenberg and Levine, 2006). Although the stakes in our incentivized lottery task can make a difference in relative wealth, especially at the lower end of the distribution, we follow the conventional approach and think of the lottery choices as informative of relative consumption in the short term.

Following the standard practice in the literature, we assume that individuals are expected utility maximizers who exhibit constant relative risk aversion (CRRA) (e.g., Binswanger, 1980; Andersen et al., 2008; Brunnermeier and Nagel, 2008; Chiappori and Paiella, 2011; Sahm, 2012; Carvalho et al., 2016a).¹⁷ The utility of a monetary amount x is then given by $u(x) = x^{1-\rho} \times (1 - \rho)^{-1}$, where ρ is the coefficient of relative risk aversion, with higher values corresponding to greater risk aversion. We calculate lower and upper bounds for the CRRA parameter ρ for each lottery as explained and displayed in Table A2. The parameters range from extreme risk aversion ($\rho > 7.51$) to risk-neutral (loving) ($\rho \leq 0$). We then model the unobserved risk preference parameters as a latent variable that is linear in its covariates:

$$CRRA_i^* = \tau \times Treatment_i + \beta_1 \times BaselineRisk + \mathbf{X}_i' \beta_2 + \epsilon_i, \quad (1)$$

where *Treatment* is an indicator for being induced to think that one's own wealth is at the lower end of the wealth distribution, *Baseline Risk* is a qualitative risk measure elicited prior to the treatment, and \mathbf{X} includes a constant term and our standard set of socio-demographic variables, as outlined in Section 2.2 (see also Table A3).

Assuming $\epsilon \sim \mathcal{N}(0, \sigma_\epsilon^2)$, we can use the mapping of observed lottery choices into theoretical intervals of CRRA values to estimate the parameters of model (1) by maximum-likelihood. For example, the choice of lottery 3 is consistent with a CRRA parameter on the interval $[0.821, 1.74]$. The likelihood contribution of an individual i choosing lottery 3 is consequently the probability that their CRRA parameter ρ falls within this interval, i.e., $Pr(0.821 \leq CRRA_i^* < 1.74)$. Note that this estimation procedure is tightly linked to an ordered probit model. The difference lies only in the fact that we construct the intervals for the latent variable, $CRRA_i^*$, based on economic theory, whereas in an ordered probit model, we would additionally need to estimate these boundaries. In

¹⁷Using panel data, Chiappori and Paiella (2011) present empirical evidence that portfolio choices across the distribution of household wealth are well described by constant relative risk aversion (see also Brunnermeier and Nagel, 2008; Sahm, 2012).

Section 4.3, we also present evidence that our results do not depend on this specific functional form of utility or estimation strategy.

Risk Parameters. In a first step, we present correlates of risk preferences with socio-demographic variables, using control group observations only. Figure A2 shows coefficient plots of estimating the parameters of model (1) for the control group. In line with most of the literature, we find that females are more risk averse and that better-educated respondents are less risk averse (e.g., Barsky et al., 1997; Dohmen et al., 2011; Chapman et al., 2018). We also find that married and unemployed respondents are more risk averse, while higher income, having better-educated fathers, and higher health satisfaction are associated with less risk aversion. Table A5 shows that these same characteristics also relate to the lottery choices.

Next, we relate our incentivized measure of risk preferences to the qualitative baseline risk measure. Prior research indicates that this qualitative measure correlates strongly with an experimentally elicited risk measure and predicts risk-taking in several life domains (Dohmen et al., 2011). Our control group data affirm this relationship as well. We see a strong correlation between our incentivized risk measure (which differs from the validation instrument in the previous literature) and baseline risk. A one standard deviation increase in the qualitative risk measure is related to a 0.57 higher CRRA parameter ρ (see Table A5, column 3).

Structural Analysis. Before we turn to the estimation of (1) for the treatment and control group, we take a non-parametric approach to look at the effect of perceived relative wealth on risk-taking. Using the raw lottery choices, we show that respondents in the treatment group have a 22 percent lower propensity to choose the safe lottery, offering a sure payoff of 50€, than respondents in the control group ($p = 0.047$, Table A9).¹⁸

Next, we show the results from estimating (1) for the treatment and control group in Table 3. Column (1) includes a treatment indicator, baseline risk attitudes, and a constant, whereas column (2) also adjusts for our set of covariates. In line with the non-parametric effect, the treatment effect is negative, indicating a decrease in risk aversion. Unsurprisingly, given the random assignment, the estimated effect is similar in both cases. The estimates point to a reduction in the measured CRRA parameter of roughly 0.53-0.56. Compared to the control group mean of 2.86, this amounts to a change of about 19 percent.¹⁹ Together with the non-parametric analysis, this is evidence of

¹⁸Figure A3 illustrates this shift by showing the distribution of lottery choices separated by the two conditions.

¹⁹Figure A4 illustrates the result from column (2) of Table 3 using the predicted CRRA parameters. It shows a sizeable

less risk aversion if respondents perceive to be at the lower end of the wealth distribution.

To put the result into perspective, we compare our estimates to other studies. For example, Carvalho et al. (2016b) estimate that a random assignment to savings accounts for rural Nepalese households leads to a 17 percent increase in risky choices in a similar lottery task. Other studies estimate gender differences in CRRA parameters of 30 percent (e.g., Garbarino et al., 2011). Given these numbers, the average treatment effect presented above appears sizable. At the same time, we must keep in mind that the average predicted CRRA parameter in both the treatment and control groups is well above zero and thus consistent with risk aversion. While the treatment shifts the level considerably, it reduces the aversion to risk and does not lead to risk neutrality or even risk-loving behavior.

4.2 Moderating the Effect: Status Concerns and Perceptions of Control

We now turn to our second contribution and examine how the response to status concerns varies with respondents' beliefs about the underlying structural causes of relative wealth. As indicated earlier, psychological research suggests that a feeling of little control over life outcomes (external LoC) are associated with a higher tendency to engage in social comparisons. Figure 1 illustrates this relationship using data from the SOEP-IS. The figure confirms that the inclination to compare oneself to others increases with more external control beliefs.²⁰ This higher inclination to comparisons can emerge from a need to improve well-being and self-esteem through favorable social comparisons, which is more relevant to people with external control beliefs as their utility gains are presumably larger than that of internal people (Wills, 1981; Wood and Taylor, 1991; Clark and Senik, 2010).²¹ In addition, our analysis of the World Value Survey suggests that these people (i.e., those with more external control beliefs) react more strongly to relative comparisons as they substantially reduce risk aversion the more inequality they face (see Section A.1 for details). Therefore, we expected that inducing a feeling of low relative wealth triggers a stronger response among external people because more risk-taking is their only way to improve relative standing and well-being.

shift of the predicted CRRA parameter ρ towards lower values in the treatment condition, meaning less risk aversion.

²⁰We draw here on the Social Comparison Scale that measures an individual's disposition towards making social comparisons. This scale is part of a different and independent SOEP-IS sample ($N = 1,388$), and thus, we cannot link the scale directly to our respondents (see notes of Figure 1 for more detail).

²¹Consistent with the idea that favorable relative comparisons boost self-perceptions and that the utility gains of such comparisons are larger for people at the lower end than at the top of the distribution, Figure A5 shows a strong and positive correlation between perceived wealth rank and self-esteem and a negative relationship with income adequacy (i.e., a higher rank translates into less need for money).

Descriptives. The median LoC score in our sample is 3 (average: 3.13, see Figure A1 for the distribution of LoC). The distribution of LoC indicates that the majority of respondents have internal control beliefs, which confirms previous findings from the SOEP (e.g., Nolte et al., 1997). In Table A5 (columns 5–6) and Figure A2, we present correlates of LoC based on control group data. Consistent with existing empirical evidence, we see an education and income gradient, i.e., more education and higher income are associated with lower external control beliefs.

Regression Analysis. In Table 3, we present regression results on these heterogeneous effects using the following specification for the latent curvature parameter of the CRRA utility:

$$CRRA_i^* = \tau * Treatment_i + \delta * LoC_i + \gamma * Treatment_i \times LoC_i + \mathbf{X}_i' \boldsymbol{\beta} + \epsilon_i. \quad (2)$$

Note that regression specification (2) includes a standardized and continuous measure of control beliefs, LoC_i . The main coefficient of interest, γ , can therefore be interpreted as the additional effect of our treatment for an individual with a one standard deviation higher LoC score.

The results are displayed in column (3) of Table 3. First, we observe that the treatment effect does not change when adjusting for heterogeneity in LoC. Second, there is a positive relationship between LoC and risk-taking, confirming the commonly observed pattern in the literature that respondents with an external LoC exhibit higher risk aversion than respondents with an internal LoC. However, the treatment reverses this relationship: respondents with a higher LoC score, indicating more external beliefs, display a stronger treatment effect, i.e., towards a lower estimated CRRA parameter ($p < 0.001$). Adjusting for basic sociodemographic characteristics has virtually no effect on the coefficient estimate of the interaction term (column 4). Moreover, the result is robust to controlling for the *false discovery rate* (FDR).²²

The magnitude of the effect is sizable: a one standard deviation shift towards more external beliefs leads to a difference in the corresponding treatment effect that is almost twice the size of the average treatment effect (Table 3, column 1). Put differently, for an individual with a 0.5 standard deviation higher LoC score, the treatment shifts the CRRA parameter downwards by almost 1. In terms of model calibration, this is equal to a difference between a relative risk aversion parameter $\rho = 2$ and log-utility.

²²In Section 4.3, we test the robustness of the moderating effect of LoC using an array of alternative factors that may drive the relationship. Therefore, we address potential concerns about multiple-hypothesis testing using the two-stage linear step-up procedure by Benjamini et al. (2006) that controls for the *false discovery rate* (see Section A.3).

The moderating role of LoC in shaping responses to status concerns is consistent with the idea that a person’s individual-specific belief system can act as a (perceived) constraint on the set of strategies available to improve relative standing (Borghans et al., 2008). For example, the appeal of gambling and other risky low-expected return strategies for moving up the social ladder depends to a reasonable extent on the availability of alternatives, such as investments in human capital or increased effort on the job. However, an external belief system may render these options less attractive as they rely more on one’s efforts and abilities. Thus, heterogeneity in these beliefs determines the set of available strategies and, thus, the response to a variation in relative standing.

4.3 Robustness

Next, we describe a battery of exercises to probe the robustness of our results. These exercises address concerns about internal validity and include alternative specifications of the outcome and LoC. Moreover, we provide evidence that other personality traits are unlikely to moderate the effect on risk-taking and on the external validity of the results.

Non-Compliance. Recall that participation in the risk-elicitation task was voluntary. Consequently, a potentially worrisome threat to internal validity is differential selection into the risk-preference elicitation task. We address this issue in several ways. First, we note that the sample is balanced on a set of important observables, including baseline risk aversion (see Table A3). Therefore, it is unlikely that the main effects are driven by differential selection with respect to pre-treatment risk aversion. Second, in Table A7, we provide further evidence that non-participation in the risk-elicitation task is orthogonal to the randomly assigned treatment status. In particular, we show that non-participation in the risk-elicitation task does not differ across conditions (panel a.) and that baseline risk aversion is the same across respondents and non-respondents (panel b.) and treatment and control (panel c.). Third, we show that our results are robust to re-weighting the study sample to match the socio-economic characteristics of the full sample. That is, we use a probit regression to predict the sampling probability of each respondent with a set of observable characteristics and use the inverse of this probability to construct individual weights. Table A8 reveals that this re-weighting exercise yields very similar results as our unweighted estimates. Taken together, there is little reason to worry that the decision to participate in the lottery task biases our estimates.

Alternative Outcome Measures. Following the literature, we impose a specific functional form – constant relative risk aversion – on respondents’ risk preferences. We provide two exercises to show that our results do not depend (i) on the functional form and (ii) the resulting estimation strategy. First, we construct a binary risk measure for choosing the safe lottery, which does not impose any functional form. Table A9 shows that treated respondents display a lower likelihood of choosing the safe lottery than non-treated respondents and that only respondents with an above-median LoC (external control beliefs) react to the treatment. Second, we use the midpoint of the CRRA intervals and estimate a linear regression model. While this alternative approach is less demanding in terms of distributional assumptions than an interval regression, it does not account for censoring and does not reflect uncertainty about the exact value in the interval. We present results from such regressions in Table A10. Qualitatively our conclusions do not change. Individuals with external control beliefs predominantly react to our treatment manipulation.

Alternative LoC Scores. As is common in the literature, we use a single index for LoC in our analysis. However, a concern is that this index is based on unweighted averages (Cobb-Clark and Schurer, 2013). An alternative is to perform a principal component analysis to extract a separate score for internal and external control beliefs (see e.g., Pinger et al., 2018). In Table A11, we interact each of the two scores with our treatment indicator. The findings corroborate our previous conclusions and show that the choice of how to represent individual LoC beliefs does not affect our conclusions in a meaningful way.

Other Personality Traits. A widespread concern is that LoC merely captures the effects of other facets of personality, such as the Big 5, optimism, or self-control. For instance, Judge et al. (2002) consider the LoC as part of a higher-level construct that is intermeshed with other traits such as neuroticism. Similarly, evidence suggests that optimism is related to LoC and risk aversion (Lerner and Keltner, 2001; Dohmen et al., 2018). We explore these concerns along two margins. First, we re-estimate regression (2) and additionally adjust for the Big 5, our optimism proxy, and a self-control score (Table A12, columns 3-5).²³ While this reduces the magnitude of the statistical

²³The optimism proxy we use here is based on the following question that we administered before the LoC questions: “If you think about the future: Are you... (1) optimistic; (2) rather optimistic than pessimistic; (3) rather pessimistic than optimistic; (4) pessimistic?”. The conclusions do not change if we instead use a measure for optimism relative to one’s peer group. Note that Dohmen et al. (2018) use a different optimism measure based on self-reported degrees of optimism and pessimism. The self-control score is based on a 13-item module following Tangney et al. (2004) that was administered by an independent study on the same sample (Cobb-Clark et al., 2019). We recode each item such that higher values are indicative of a stronger sense of self-control. Subsequently, we standardized their sum using the sample mean and

association between LoC and our risk measure, it does not affect the coefficient estimates of interest: the treatment and interaction effect. This is also true if we condition on all other personality traits at the same time (Table A12, column 6). Second, in Table A13, we additionally show that none of the alternative traits are stand-ins for LoC by fitting models that interact our treatment with each component of the Big 5, optimism, and self-control separately. In contrast to LoC, none of the interactions between these other personality traits are statistically distinguishable from zero, which is reassuring evidence that the treatment effect we observe is moderated by LoC and not by other personality traits.

Emotions. There is some evidence that risk preferences and LoC are tightly linked to emotions (e.g., Loewenstein et al., 2001; Cohn et al., 2015; Meier, 2022). To investigate the potential role of emotions in moderating the treatment effect, we follow the same approach as in our analysis of personality traits above. In Table A14, we re-estimate regression (2) and control for anger, fear, and a combined measure of happiness and sadness.²⁴ Again, we basically see that our main result is robust to controlling for emotions. Next, we interact each of these emotions with our treatment and report the results in Table A15. We find no indication of heterogeneity in our results that are related to emotions. Moreover, the analysis of the manipulation check in Section 3 revealed no evidence for an effect of the treatment on the affective states of respondents. Together, this suggests that emotions play little role in our context: neither as moderators nor as an alternative channel of the treatment.

Other Socio-Economic Characteristics. To explore whether the heterogeneous effects of LoC just pick up heterogeneity in some socio-economic characteristics, we rerun our specification (2) with socio-economic characteristics that are associated with LoC, such as unemployment status, income, and education. Differentiating respondents along these categories also reveals substantial differences in their tolerance of risk. This is, for example, true for gender: women are more risk averse than men.²⁵ However, we find no evidence that any of these socio-economic characteristics interact with the treatment, suggesting that LoC affects heterogeneity independent of these characteristics (Table A16).

standard deviation.

²⁴The SOEP-IS routinely asks how often respondents experienced anger, fear, happiness, and sadness in the four weeks prior to the interview. Following the literature, we combine happiness and sadness in an index by taking the average of their difference and adjusting the index to be in the same range as the other emotions (see Meier, 2022).

²⁵The sample gender difference in the implicit CRRA parameter is roughly 33%, and the unemployed/employed contrast is 29%. Both magnitudes lie well above the difference observed for LoC.

Inequality. We provide evidence that our findings extend beyond our context (see Section A.1). Relative position in the wealth (and income) distribution is naturally linked to inequality because the distribution affects how much richer others are. At the aggregate level, this notion of relative deprivation is related to the Gini coefficient (Yitzhaki, 1979; Hey and Lambert, 1980). Using data from the World Value Survey, we show that greater income inequality is linked to lower risk aversion and that external control beliefs moderate this relationship.

5 Conclusion

We have presented evidence for the causal link between status concerns and risk-taking. People are less risk averse if they perceive their relative standing in the wealth distribution as low. This effect is particularly strong among people who tend to believe that life outcomes are more likely the result of luck and fate.

Our result challenges recent theoretical models addressing the link between status concerns and risk-taking (e.g., Becker et al., 2005; Ray and Robson, 2012; Kuziemko et al., 2014; Hopkins, 2018). While the insights of these models are confined to objective status concerns, we show that the link between status concerns and risk-taking is governed by perceptions. This not only implies that concerns about relative wealth can matter along a large segment of the wealth distribution as long as people *perceive* their relative standing as low, but also that the *nature of risk-taking* varies across the distribution. In particular, unproductive risk-taking is likely more frequent among less well-endowed individuals. In contrast, risk-taking in the form of entrepreneurship is typically only feasible at higher wealth levels (Becker et al., 2005). The former often corresponds to risk-seeking behavior, for example, gambling and other risky activities with low average returns, while the latter can be seen as a more productive risk. Therefore, as long as the higher propensity to take risks is reflected in efficient ways of gambling, such as entrepreneurial activities, educational investments, and occupational choices, we likely see positive welfare effects.

Similar to most other empirical case studies, our study is not without limitations. To elicit risk preferences in an incentivized way, we necessarily had to rely on lottery choices involving moderate stakes. A natural question is, thus, how our results carry over to settings with higher stakes. Relatedly, our focus is restricted to possible relative standing improvements because it was impossible to elicit risky choices in the negative outcome domain. Negative outcomes are, however, common, and a real-world application that addresses issues around negative outcomes

and merits further study is insurance choices. While we cannot observe these choices, our focus on risk preferences helps us predict behavioral responses to status concerns across various domains. For example, if the effect of relative comparisons on risk-taking is sufficiently symmetric around gains and losses, our results indicate that individuals might be less inclined to spend money on insurance if they are concerned about their low relative standing.

References

- ABEL, A. B. (1990): "Asset prices under habit formation and catching up with the Joneses," *American Economic Review*, 80, 38–42.
- AKESAKA, M., P. EIBICH, C. HANAOKA, AND H. SHIGEOKA (2023): "Temporal instability of risk preference among the poor: Evidence from payday cycles," *American Economic Journal: Applied Economics*, forthcoming.
- ALAOUI, L. AND A. PENTA (2022): "Attitudes Towards Success and Failure," *Working Paper*.
- ALESINA, A. AND G.-M. ANGELETOS (2005): "Fairness and redistribution," *American Economic Review*, 95, 960–980.
- ALMÅS, I., A. W. CAPPELEN, AND B. TUNGODDEN (2020): "Cutthroat capitalism versus cuddly socialism: Are Americans more meritocratic and efficiency-seeking than Scandinavians?" *Journal of Political Economy*, 128, 1753–1788.
- ALMLUND, M., A. L. DUCKWORTH, J. HECKMAN, AND T. KAUTZ (2011): "Personality psychology and economics," in *Handbook of the Economics of Education*, Elsevier, vol. 4, 1–181.
- ANDERSEN, S., G. W. HARRISON, M. I. LAU, AND E. E. RUTSTRÖM (2008): "Eliciting risk and time preferences," *Econometrica*, 76, 583–618.
- ASPINWALL, L. G. AND S. E. TAYLOR (1993): "Effects of social comparison direction, threat, and self-esteem on affect, self-evaluation, and expected success." *Journal of Personality and Social Psychology*, 64, 708.
- BARÓN, J. D. AND D. A. COBB-CLARK (2010): "Are young people's educational outcomes linked to their sense of control?" *IZA Discussion Paper*.

- BARSKY, R. B., F. T. JUSTER, M. S. KIMBALL, AND M. D. SHAPIRO (1997): "Preference parameters and behavioral heterogeneity: An experimental approach in the health and retirement study," *Quarterly Journal of Economics*, 112, 537–579.
- BECKER, A., T. DECKERS, T. DOHMEN, A. FALK, AND F. KOSSE (2012): "The relationship between economic preferences and psychological personality measures," *Annual Review of Economics*, 4, 453–478.
- BECKER, G. S., K. M. MURPHY, AND I. WERNING (2005): "The equilibrium distribution of income and the market for status," *Journal of Political Economy*, 113, 282–310.
- BENJAMINI, Y., A. M. KRIEGER, AND D. YEKUTIELI (2006): "Adaptive linear step-up procedures that control the false discovery rate," *Biometrika*, 93, 491–507.
- BERTRAND, M. AND S. MULLAINATHAN (2001): "Do people mean what they say? Implications for subjective survey data," *American Economic Review*, 91, 67–72.
- BINSWANGER, H. P. (1980): "Attitudes toward risk: Experimental measurement in rural India," *American Journal of Agricultural Economics*, 62, 395–407.
- BORGHANS, L., A. L. DUCKWORTH, J. J. HECKMAN, AND B. TER WEEL (2008): "The economics and psychology of personality traits," *Journal of Human Resources*, 43, 972–1059.
- BOTTAN, N. L. AND R. PEREZ-TRUGLIA (2022): "Choosing Your Pond: Location Choices and Relative Income," *Review of Economics and Statistics*, 104, 1010–1027.
- BROWN, R., V. MONTALVA, D. THOMAS, AND A. VELÁSQUEZ (2019): "Impact of violent crime on risk aversion: Evidence from the Mexican drug war," *Review of Economics and Statistics*, 101, 892–904.
- BRUNNERMEIER, M. K. AND S. NAGEL (2008): "Do wealth fluctuations generate time-varying risk aversion? Micro-evidence on individuals," *American Economic Review*, 98, 713–36.
- BUUNK, A. P. AND F. X. GIBBONS (2007): "Social comparison: The end of a theory and the emergence of a field," *Organizational Behavior and Human Decision Processes*, 102, 3–21.
- CALIENDO, M., D. A. COBB-CLARK, C. OBST, H. SEITZ, AND A. UHLENDORFF (2022): "Locus of control and investment in training," *Journal of Human Resources*, 57, 1311–1349.

- CALIENDO, M., D. A. COBB-CLARK, AND A. UHLENDORFF (2015): "Locus of control and job search strategies," *Review of Economics and Statistics*, 97, 88–103.
- CALLEN, M., M. ISAQZADEH, J. D. LONG, AND C. SPRENGER (2014): "Violence and risk preference: Experimental evidence from Afghanistan," *American Economic Review*, 104, 123–48.
- CAMERON, L. AND M. SHAH (2015): "Risk-taking behavior in the wake of natural disasters," *Journal of Human Resources*, 50, 484–515.
- CARD, D., A. MAS, E. MORETTI, AND E. SAEZ (2012): "Inequality at work: The effect of peer salaries on job satisfaction," *American Economic Review*, 102, 2981–3003.
- CARROLL, C. D., J. OVERLAND, AND D. N. WEIL (2000): "Saving and growth with habit formation," *American Economic Review*, 90, 341–355.
- CARVALHO, L. S., S. MEIER, AND S. W. WANG (2016a): "Poverty and economic decision-making: Evidence from changes in financial resources at payday," *American Economic Review*, 106, 260–84.
- CARVALHO, L. S., S. PRINA, AND J. SYDNOR (2016b): "The effect of saving on risk attitudes and intertemporal choices," *Journal of Development Economics*, 120, 41–52.
- CAVALLO, A., G. CRUCES, AND R. PEREZ-TRUGLIA (2017): "Inflation expectations, learning, and supermarket prices: Evidence from survey experiments," *American Economic Journal: Macroeconomics*, 9, 1–35.
- CHAPMAN, J., E. SNOWBERG, S. WANG, AND C. CAMERER (2018): "Loss attitudes in the US population: Evidence from dynamically optimized sequential experimentation (DOSE)," *NBER Working Paper w25072*.
- CHARNESS, G., U. GNEEZY, AND A. IMAS (2013): "Experimental methods: Eliciting risk preferences," *Journal of Economic Behavior & Organization*, 87, 43–51.
- CHIAPPORI, P.-A. AND M. PAIELLA (2011): "Relative risk aversion is constant: Evidence from panel data," *Journal of the European Economic Association*, 9, 1021–1052.
- CHUANG, Y. AND L. SCHECHTER (2015): "Stability of experimental and survey measures of risk, time, and social preferences: A review and some new results," *Journal of Development Economics*, 117, 151–170.

- CLARK, A. E. AND C. SENIK (2010): "Who compares to whom? The anatomy of income comparisons in Europe," *Economic Journal*, 120, 573–594.
- COBB-CLARK, D. A. (2015): "Locus of control and the labor market," *IZA Journal of Labor Economics*, 4, 3.
- COBB-CLARK, D. A., S. DAHMANN, D. KAMHÖFER, AND H. SCHILDBERG-HÖRISCH (2019): "Self-control: Determinants, life outcomes and intergenerational implications," .
- COBB-CLARK, D. A. AND S. SCHURER (2013): "Two economists' musings on the stability of locus of control," *Economic Journal*, 123, F358–F400.
- COHN, A., J. ENGELMANN, E. FEHR, AND M. A. MARÉCHAL (2015): "Evidence for countercyclical risk aversion: An experiment with financial professionals," *American Economic Review*, 105, 860–85.
- COHN, A., E. FEHR, B. HERRMANN, AND F. SCHNEIDER (2014): "Social comparison and effort provision: Evidence from a field experiment," *Journal of the European Economic Association*, 12, 877–898.
- COIBION, O., Y. GORODNICHENKO, M. KUDLYAK, AND J. MONDRAGON (2020): "Greater Inequality and Household Borrowing: New Evidence from Household Data," *Journal of the European Economic Association*, 18, 2922–2971.
- COLEMAN, M. AND T. DELEIRE (2003): "An economic model of locus of control and the human capital investment decision," *Journal of Human Resources*, 38, 701–721.
- CRUCES, G., R. PEREZ-TRUGLIA, AND M. TETAZ (2013): "Biased perceptions of income distribution and preferences for redistribution: Evidence from a survey experiment," *Journal of Public Economics*, 98, 100–112.
- DAVE, C., C. C. ECKEL, C. A. JOHNSON, AND C. ROJAS (2010): "Eliciting risk preferences: When is simple better?" *Journal of Risk and Uncertainty*, 41, 219–243.
- DIJK, O. (2017): "For whom does social comparison induce risk-taking?" *Theory and Decision*, 82, 519–541.

- DOHMEN, T., A. FALK, D. HUFFMAN, U. SUNDE, J. SCHUPP, AND G. G. WAGNER (2011): "Individual risk attitudes: Measurement, determinants, and behavioral consequences," *Journal of the European Economic Association*, 9, 522–550.
- DOHMEN, T., A. NON, AND T. STOLP (2021): "Reference points and the tradeoff between risk and incentives," *Journal of Economic Behavior & Organization*, 192, 813–831.
- DOHMEN, T. J., S. QUERCIA, AND J. WILLRODT (2018): "Willingness to take risk: The role of risk conception and optimism," *IZA Discussion Paper No. 11642*.
- DUESENBERY, J. S. (1949): *Income, saving and the theory of consumer behavior*, Cambridge, MA: Harvard University Press.
- ECKEL, C. C., M. A. EL-GAMAL, AND R. K. WILSON (2009): "Risk loving after the storm: A Bayesian-Network study of Hurricane Katrina evacuees," *Journal of Economic Behavior & Organization*, 69, 110–124.
- ECKEL, C. C. AND P. J. GROSSMAN (2002): "Sex differences and statistical stereotyping in attitudes toward financial risk," *Evolution and Human Behavior*, 23, 281–295.
- FAFCHAMPS, M., B. KEBEDE, AND D. J. ZIZZO (2015): "Keep up with the winners: Experimental evidence on risk taking, asset integration, and peer effects," *European Economic Review*, 79, 59–79.
- FALK, A., A. BECKER, T. DOHMEN, B. ENKE, D. HUFFMAN, AND U. SUNDE (2018): "Global evidence on economic preferences," *Quarterly Journal of Economics*, 133, 1645–1692.
- FEHR, D., J. MOLLERSTROM, AND R. PEREZ-TRUGLIA (2022a): "Listen to her: Gender differences in information diffusion within the household," *NBER Working Paper 30513*.
- (2022b): "Your Place in the World: Relative Income and Global Inequality," *American Economic Journal: Economic Policy*, 14, 232–68.
- FEHR, D. AND M. VOLLMANN (2022): "Misperceiving economic success: Experimental evidence on meritocratic beliefs and inequality acceptance," .
- FISKE, S. T. (2011): *Envy up, scorn down: How status divides us*, Russell Sage Foundation.
- FITZENBERGER, B., G. MENA, J. NIMCZIK, AND U. SUNDE (2021): "Personality traits across the life cycle: Disentangling age, period and cohort effects," *Economic Journal*, 132, 2141–2172.

- FLIESSBACH, K., B. WEBER, P. TRAUTNER, T. DOHMEN, U. SUNDE, C. E. ELGER, AND A. FALK (2007): "Social comparison affects reward-related brain activity in the human ventral striatum," *Science*, 318, 1305–1308.
- FRANK, R. H. (1985): "The demand for unobservable and other nonpositional goods," *American Economic Review*, 75, 101–116.
- FRIEDMAN, M. AND L. J. SAVAGE (1948): "The utility analysis of choices involving risk," *Journal of Political Economy*, 56, 279–304.
- FUCHS-SCHÜNDELN, N. AND M. SCHÜNDELN (2005): "Precautionary savings and self-selection: evidence from the German reunification experiment," *Quarterly Journal of Economics*, 120, 1085–1120.
- FUDENBERG, D. AND D. K. LEVINE (2006): "A dual-self model of impulse control," *American Economic Review*, 96, 1449–1476.
- GALI, J. (1994): "Keeping up with the Joneses: Consumption externalities, portfolio choice, and asset prices," *Journal of Money, Credit and Banking*, 26, 1–8.
- GAMBA, A., E. MANZONI, AND L. STANCA (2017): "Social comparison and risk taking behavior," *Theory and Decision*, 82, 221–248.
- GARBARINO, E., R. SLONIM, AND J. SYDNOR (2011): "Digit ratios (2D: 4D) as predictors of risky decision making for both sexes," *Journal of Risk and Uncertainty*, 42, 1–26.
- GENICOT, G. AND D. RAY (2020): "Aspirations and economic behavior," *Annual Review of Economics*, 12, 715–746.
- GOEBEL, J., M. M. GRABKA, S. LIEBIG, M. KROH, D. RICHTER, C. SCHRÖDER, AND J. SCHUPP (2018): "The German Socio-Economic Panel (SOEP)," *Jahrbücher für Nationalökonomie und Statistik*.
- GREGORY, N. (1980): "Relative wealth and risk taking: A short note on the Friedman-Savage utility function," *Journal of Political Economy*, 88, 1226–1230.
- HAALAND, I., C. ROTH, AND J. WOHLFART (2023): "Designing information provision experiments," *Journal of Economic Literature*, 61, 3–40.

- HAISLEY, E., R. MOSTAFA, AND G. LOEWENSTEIN (2008): "Subjective relative income and lottery ticket purchases," *Journal of Behavioral Decision Making*, 21, 283–295.
- HANAOKA, C., H. SHIGEOKA, AND Y. WATANABE (2018): "Do risk preferences change? Evidence from the Great East Japan Earthquake," *American Economic Journal: Applied Economics*, 10, 298–330.
- HECKMAN, J. J., T. JAGELKA, AND T. KAUTZ (2021): "Some Contributions of Economics to the Study of Personality," in *Handbook of Personality: Theory and Research*, ed. by O. P. John and R. W. Robins, The Guilford Press, 853–892.
- HECKMAN, J. J. AND T. KAUTZ (2012): "Hard evidence on soft skills," *Labour Economics*, 19, 451–464.
- HECKMAN, J. J., J. STIXRUD, AND S. URZUA (2006): "The effects of cognitive and noncognitive abilities on labor market outcomes and social behavior," *Journal of Labor Economics*, 24, 411–482.
- HEY, J. D. AND P. J. LAMBERT (1980): "Relative Deprivation and the Gini Coefficient: Comment," *Quarterly Journal of Economics*, 95, 567–573.
- HFCS, DEUTSCHE BUNDESBANK (2016): "Vermögen und Finanzen privater Haushalte in Deutschland: Ergebnisse der Vermögensbefragung 2014," *Monatsbericht März*, 61.
- (2019): "Vermögen und Finanzen privater Haushalte in Deutschland: Ergebnisse der Vermögensbefragung 2017," *Monatsbericht April*, 71.
- HOPKINS, E. (2018): "Inequality and risk-taking behaviour," *Games and Economic Behavior*, 107, 316–328.
- HOPKINS, E. AND T. KORNIENKO (2004): "Running to keep in the same place: Consumer choice as a game of status," *American Economic Review*, 94, 1085–1107.
- INGLEHART, R., C. HAERPFER, A. MORENO, C. WELZEL, K. KIZILOVA, J. DIEZ-MEDRANO, M. LAGOS, P. NORRIS, E. PONARIN, B. PURANEN, ET AL. (2014): "World values survey: All rounds-country-pooled datafile version," *Madrid: JD Systems Institute*.
- JAGELKA, T. (forthcoming): "Are economists' preferences psychologists' personality traits? A structural approach," *Journal of Political Economy*.

- JAKIELA, P. AND O. OZIER (2019): "The impact of violence on individual risk preferences: evidence from a natural experiment," *Review of Economics and Statistics*, 101, 547–559.
- JUDGE, T. A., A. EREZ, J. E. BONO, AND C. J. THORESEN (2002): "Are measures of self-esteem, neuroticism, locus of control, and generalized self-efficacy indicators of a common core construct?" *Journal of Personality and Social Psychology*, 83, 693.
- KARADJA, M., J. MOLLERSTROM, AND D. SEIM (2017): "Richer (and holier) than thou? The effect of relative income improvements on demand for redistribution," *Review of Economics and Statistics*, 99, 201–212.
- KIRCHLER, M., F. LINDNER, AND U. WEITZEL (2018): "Rankings and Risk-Taking in the Finance Industry," *Journal of Finance*, 73, 2271–2302.
- KUZIEMKO, I., R. W. BUELL, T. REICH, AND M. I. NORTON (2014): "'Last-place aversion': Evidence and redistributive implications," *Quarterly Journal of Economics*, 129, 105–149.
- LA FERRARA, E. (2019): "Aspirations, social norms, and development," *Journal of the European Economic Association*, 17, 1687–1722.
- LERNER, J. S. AND D. KELTNER (2001): "Fear, anger, and risk." *Journal of Personality and Social Psychology*, 81, 146.
- LJUNGQVIST, L. AND H. UHLIG (2000): "Tax policy and aggregate demand management under catching up with the Joneses," *American Economic Review*, 90, 356–366.
- LOEWENSTEIN, G. F., E. U. WEBER, C. K. HSEE, AND N. WELCH (2001): "Risk as feelings." *Psychological Bulletin*, 127, 267.
- LUTTMER, E. (2005): "Neighbors as negatives: Relative earnings and well-being," *Quarterly Journal of Economics*, 120, 963–1002.
- MALMENDIER, U. AND S. NAGEL (2011): "Depression babies: Do macroeconomic experiences affect risk taking?" *Quarterly Journal of Economics*, 126, 373–416.
- MEIER, A. N. (2022): "Emotions and risk attitudes," *American Economic Journal: Applied Economics*, 14, 527–558.

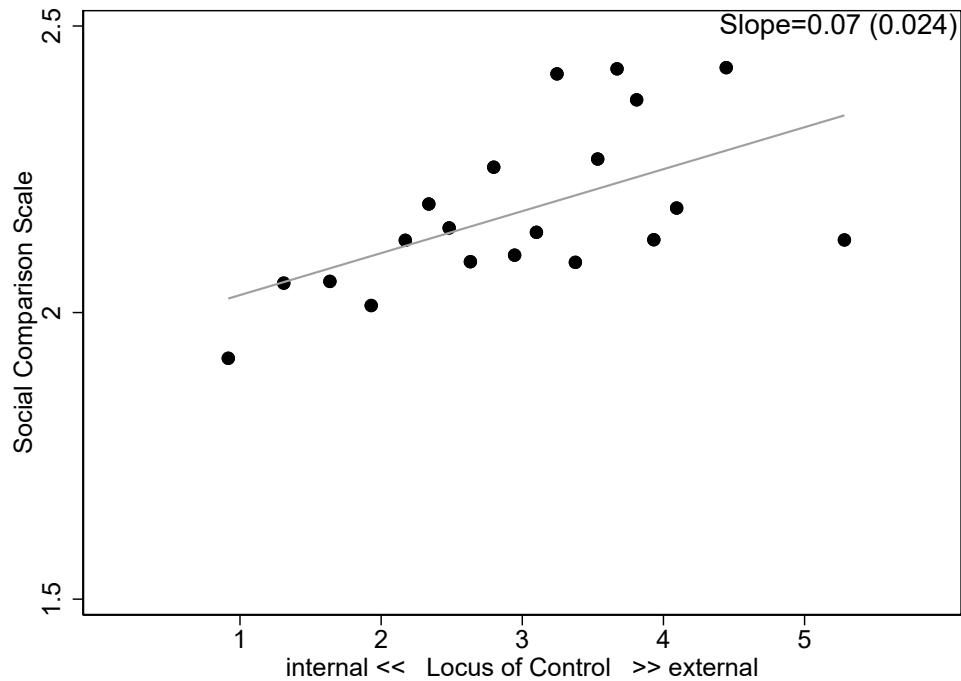
- MENON, G., P. RAGHUBIR, AND N. SCHWARZ (1997): "How much will I spend? Factors affecting consumers' estimates of future expense," *Journal of Consumer Psychology*, 6, 141–164.
- NOLTE, H., C. WEISCHER, U. WILKESMANN, J. MAETZEL, AND H. G. TEGETHOFF (1997): "Kontrolleinstellungen zum Leben und zur Zukunft–Auswertung eines neuen, sozialpsychologischen Itemblocks im sozio-oekonomischen Panel," *Diskussionspapier der Fakultät für Sozialwissenschaft der Ruhr-Universität Bochum*.
- NORTON, M. I. AND D. ARIELY (2011): "Building a better America—One wealth quintile at a time," *Perspectives on Psychological Science*, 6, 9–12.
- PEREZ-TRUGLIA, R. (2020): "The Effects of income transparency on well-being: Evidence from a natural experiment," *American Economic Review*, 110, 1019–54.
- PICKARD, H., T. DOHMEN, AND B. VAN LANDEGHEM (2023): "Inequality and Risk Preference," *IZA Discussion Paper No. 15854*.
- PINGER, P., S. SCHÄFER, AND H. SCHUMACHER (2018): "Locus of control and consistent investment choices," *Journal of Behavioral and Experimental Economics*, 75, 66–75.
- RABIN, M. (2000): "Risk aversion and Expected-Utility Theory: A calibration theorem," *Econometrica*, 68, 1281–1292.
- RAY, D. AND A. ROBSON (2012): "Status, intertemporal choice, and risk-taking," *Econometrica*, 80, 1505–1531.
- RICHTER, D., M. METZING, M. WEINHARDT, AND J. SCHUPP (2013): "SOEP scales manual," Tech. rep., SOEP Survey Papers.
- RICHTER, D. AND J. SCHUPP (2015): "The SOEP Innovation Sample (SOEP IS)," *Schmollers Jahrbuch*, 135, 389–399.
- ROBSON, A. J. (1996): "The evolution of attitudes to risk: Lottery tickets and relative wealth," *Games and Economic Behavior*, 14, 190–207.
- ROCKWOOD, T. H., R. L. SANGSTER, AND D. A. DILLMAN (1997): "The effect of response categories on questionnaire answers: context and mode effects," *Sociological Methods & Research*, 26, 118–140.

- ROTH, P. (2023): "Inequality, Relative Deprivation and Financial Distress: Evidence from Swedish Register Data," *Review of Economics and Statistics*, 1–45.
- ROTTER, J. B. (1966): "Generalized expectancies for internal versus external control of reinforcement." *Psychological Monographs: General and Applied*, 80, 1.
- SAHM, C. R. (2012): "How much does risk tolerance change?" *Quarterly Journal of Finance*, 2, 1250020.
- SCHILDBERG-HÖRISCH, H. (2018): "Are risk preferences stable?" *Journal of Economic Perspectives*, 32, 135–54.
- SCHNEIDER, S. AND J. SCHUPP (2011): "The social comparison scale: testing the validity, reliability, and applicability of the Iowa-Netherlands Comparison Orientation Measure (INCOM) on the German population," .
- SCHRÖDER, C., C. BARTELS, K. GÖBLER, M. M. GRABKA, J. KÖNIG, R. SIEGERS, AND S. ZINN (2020): "Improving the coverage of the top-wealth population in the Socio-Economic Panel (SOEP)," Tech. rep., DIW Berlin, The German Socio-Economic Panel (SOEP).
- SCHWARTZ, S. H. (1992): "Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries," *Advances in Experimental Social Psychology*, 25, 1–65.
- SCHWARZ, N., H.-J. HIPPLER, B. DEUTSCH, AND F. STRACK (1985): "Response scales: Effects of category range on reported behavior and comparative judgments," *Public Opinion Quarterly*, 49, 388–395.
- SCHWERTER, F. (2023): "Social reference points and risk taking," *Management Science*, forthcoming.
- SPECHT, J., B. EGLOFF, AND S. C. SCHMUKLE (2013): "Everything under control? The effects of age, gender, and education on trajectories of perceived control in a nationally representative German sample." *Developmental Psychology*, 49, 353.
- TANGNEY, J. P., R. F. BAUMEISTER, AND A. L. BOONE (2004): "High self-control predicts good adjustment, less pathology, better grades, and interpersonal success," *Journal of Personality*, 72, 271–324.
- TESTA, M. AND B. MAJOR (1990): "The impact of social comparisons after failure: The moderating effects of perceived control," *Basic and Applied Social Psychology*, 11, 205–218.

- VEBLEN, T. (1899): *The theory of the leisure class*, New York: MacMillan.
- VOORS, M. J., E. E. NILLESEN, P. VERWIMP, E. H. BULTE, R. LENSINK, AND D. P. VAN SOEST (2012): "Violent conflict and behavior: a field experiment in Burundi," *American Economic Review*, 102, 941–64.
- WILLS, T. A. (1981): "Downward comparison principles in social psychology." *Psychological Bulletin*, 90, 245.
- WOOD, J. V. AND K. L. TAYLOR (1991): "Serving self-relevant goals through social comparison," in *Social comparison: Contemporary theory and research*, ed. by J. Suls and T. A. Wills, Lawrence Erlbaum Associates, Inc., 23–49.
- YITZHAKI, S. (1979): "Relative deprivation and the Gini coefficient," *Quarterly Journal of Economics*, 93, 321–324.

Figures

Figure 1: Locus of Control and Relative Comparisons



Notes: Binned scatterplots of LoC and relative comparisons using data from a different representative SOEP-IS sample ($N = 1,388$). LoC is proxied by the belief that *life is mostly controlled by fate* and the belief that *working hard enough likely results in a good life*; we constructed an equally weighted index of these two beliefs with higher values indicating more external beliefs. Relative comparisons are measured with a short version of the Social Comparison Scale (Schneider and Schupp, 2011), which is an equally weighted index of three statements about a person's tendency to engage in social comparisons with higher values indicating higher dispositions towards social comparison. The statements are *I often compare myself with others with respect to what I have accomplished in life*, *I often compare my social skills and popularity with those of other people*, and *I always pay very strong attention to how I do things compared to others*. All measured on a scale from 1 (disagree strongly) to 5 (agree strongly). Control variables include age, gender, education, parents' education, equivalized net income, marital status, household size, employment status (self-employed, unemployed, retired), baseline risk aversion, homeownership, satisfaction with health, life satisfaction, and region (East/West Germany). Data: SOEP-IS Sample I2/I4.

Tables

Table 1: Wealth Categories by Treatment

Control Group		Treatment Group	
<i>Wealth Category (in €)</i>	<i>% responses</i>	<i>Wealth Category (in €)</i>	<i>% responses</i>
<2,500	27.05	<275,000	79.01
2,501 – 11,000	20.00	275,001 – 468,000	12.74
11,001 – 27,000	11.59	468,001 – 722,000	5.19
27,001 – 112,000	16.82	722,001 – 989,000	1.65
>112,000	24.55	>989,000	1.42

Notes: Wealth categories used in the two conditions and share of observed responses in each category. Upper bounds taken from 2014 Household Finance and Consumption Survey (HFCS, Deutsche Bundesbank, 2016). Data: SOEP-IS Sample I3.

Table 2: First-Stage Effects of Treatment and Manipulation Check

	First Stage	Manipulation Check		
	(1) Income Top 10%	(2) Median net wealth	(3) Wealth Top 10%	(4) Rel. Wealth
Treated	0.293** (0.139)	0.240 (0.148)	0.483** (0.231)	-0.172*** (0.062)
Sample	SOEP-IS	respondi	respondi	respondi
Observations	865	987	987	987

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. GLM regressions (gamma-log; columns 1–3) and OLS regression (column 4) with standard errors in parentheses. First stage based on SOEP-IS Data and manipulation check based on respondi sample (see Section A.2). The first-stage dependent variable (“Income Top 10%”) is the estimated threshold for being in the top 10% of the pre-tax household income distribution in Germany (“In your estimation, what gross annual income do you need to be in the top 10 percent of German households?”). “Median net wealth” is the estimate of the median of the wealth distribution (“What do you think is the net wealth of the household in the middle of the ladder?”); “Wealth Top 10%” is the estimated net wealth at the 90th percentile (“What do you think is the required net wealth to belong to the 10% richest households (i.e. to be on the top rung of the ladder)?”); “Rel. wealth” is a respondent’s perceived rank in the wealth distribution (“What do you think is the share of households in Germany that have less net wealth than your household?”), which is standardized to zero mean and unit variance. Covariates include age, gender, education, parents’ education, equivalized net income, marital status, household size, employment status (self-employed, unemployed, retired), homeownership, and region (East/West Germany). Data: SOEP-IS Sample I3 and respondi.

Table 3: Main Treatment Effects

	CRRRA Parameter			
	(1)	(2)	(3)	(4)
Treated	-0.531*† (0.282)	-0.561**† (0.279)	-0.535*† (0.281)	-0.551**† (0.277)
Treated x LoC			-0.953***/# (0.283)	-0.952***/# (0.278)
LoC			0.566*** (0.208)	0.385* (0.213)
Baseline Risk	0.357** (0.141)	0.313** (0.142)	0.374*** (0.142)	0.342** (0.141)
Constant	2.865*** (0.199)	3.496*** (1.068)	2.885*** (0.198)	3.747*** (1.083)
Covariates	No	Yes	No	Yes
Observations	914	914	914	914
Log-Likelihood	-2074.25	-2055.64	-2068.51	-2049.49

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; † $p < 0.05$, p-value from randomization inference (5000 replications); # indicates significance when using the two-stage linear step-up procedure by Benjamini et al. (2006) that controls for the *false discovery rate* (FDR). Interval regressions with standard errors in parentheses. The dependent variable is the CRRRA parameter ρ (with lower values indicating higher tolerance for risk). *LoC* is the z-score of a single index for locus of control, constructed as detailed in Table A1. Higher values correspond to more external beliefs. Covariates include age, gender, education, parents' education, equivalized net income, marital status, household size, employment status (self-employed, unemployed, retired), homeownership, satisfaction with health, life satisfaction, and region (East/West Germany). Data: SOEP-IS Sample I3.

Appendix – For Online Publication Only

Status, Control Beliefs, and Risk-Taking

Dietmar Fehr and Yannick Reichlin

A.1 Income Inequality, Risk-Taking, and Control Beliefs

In this section, we document the relationship between income inequality and risk-taking and that this relationship is moderated by an external locus of control. Inequality is tightly linked to the relative position in the wealth (and income) distribution. The distribution of wealth affects how much richer others are, and this notion of relative deprivation translates into the Gini coefficient at the aggregate level (Yitzhaki, 1979; Hey and Lambert, 1980). The reported findings are based on the analysis of data from two large-scale international surveys: the Global Preference Survey (Falk et al., 2018) and the World Value Survey (Inglehart et al., 2014).

Global Preference Survey (GPS). The GPS contains a validated risk measure, elicited in nationally representative samples of 76 countries spanning some 90% of the world's population. The risk measure is a weighted average of a qualitative self-assessment of risk tolerance akin to the qualitative measure in the SOEP (see section 4.3) and a quantitative measure of a sequence of lottery choices. We focus here on the aggregated level and compare national-level summary statistics of the risk measure with a national-level measure of inequality, the Gini index, taken from the World Bank's World Development Indicators (WDI). The two measures are significantly correlated ($p=0.005$) with a Pearson correlation coefficient of 0.33, suggesting that in more unequal countries, the population is, on average, more risk-tolerant. Pickard et al. (2023), in work initiated after our initial working paper, provide a more detailed account of inequality and risk-taking using the GPS. We next turn to an individual-level analysis that allows us to consider the moderating effect of LoC.

World Value Survey (WVS). The WVS collects socio-demographic information, political attitudes, and value judgments from nationally representative samples in repeated cross-sections. Wave 5 (2005-2009) and Wave 6 (2010-2014) contain two questions that are particularly relevant to our

purposes. First, the waves include a measure of risk attitudes developed by Schwartz (1992), which asks respondents to compare themselves to a hypothetical person who finds it important to “experience adventure and [take] risks.” Answers range on a scale from (1) *very much like me* to (6) *not at all like me*. The measure captures sensation-seeking as developed by personality psychologists and is conceptually related to economists’ notion of risk-aversion (Almlund et al., 2011). Second, they include a proxy for locus of control. Respondents are asked about their view of whether they can decide their own destiny or whether it is impossible to escape a predetermined fate on a scale from (1) *everything is determined by fate* to (10) *people shape their fate themselves*. To ease interpretation, we standardize answers to both questions by their sample mean and standard deviation and recode the LoC question such that higher values imply more external beliefs.

In our analysis, we use Wave 5 and 6 of the WVS and merge this data with information on national-level inequality from the WDI. This leaves us with a sample of 145,206 individual observations, coming from 71 countries and spanning 12 years. We estimate linear regressions of measured risk attitudes on a proxy for inequality, locus of control beliefs, and their interaction. Table A17 shows that individual risk aversion is negatively correlated with national-level inequality. This complements the aggregate-level correlation we have seen in the GPS that is based on a validated risk measure. Moreover, we see that this relationship is considerably more pronounced for individuals with external control beliefs and robust to including a battery of observable socio-demographic variables, survey year fixed effects, and dummies for cultural country clusters.

This result from the WVS suggests that our evidence has broader significance as it applies to the distribution of income, which itself may affect the degree to which people seek relative comparisons, and extends beyond the German context.

A.2 Manipulation Check

Setup. After the main study, we conducted a separate survey experiment to illustrate through which channel our intervention affects risk-taking. In the initial survey, we only implemented a basic test of how the intervention affects relative standing because we had to economize on the limited survey time and wanted to minimize demand and anchoring effects. Therefore, the goal of this second survey was to directly measure the impact of the intervention on (i) respondents’ perceived relative position in the wealth distribution and (ii) the perceived wealth level. For this purpose, we recruited a new sample ($N = 987$) through *respondi*, an internationally well-known

panel provider, since we no longer had access to the SOEP-IS. We implemented a short survey (median duration six minutes), in which we randomized respondents into treatment and control conditions using the same intervention as in the initial survey. That is, we either presented five wealth categories with wide intervals (treatment) or small intervals (control), and respondents had to indicate into which category their net wealth falls. Note that we updated the upper bounds of the intervals according to the latest available wealth data for Germany (see Table A18).

We are mainly interested in two potential channels through which the intervention may affect risk-taking. First, we test the relative standing channel through a qualitative and a quantitative question. Specifically, we ask how respondents perceive their wealth situation relative to other households and how they perceive their relative rank in the German wealth distribution.

1. Compared to most other households in Germany, would you say that your wealth situation is ...? *[much worse, worse, the same, better, much better]*
2. What do you think is the share of households in Germany that have less net wealth than your household?

0 percent (%) means that all households have more net wealth than your household and 100 percent (%) means that no household has more net wealth.

Second, we test to what extent the intervention affects how respondents perceive the wealth distribution. We address this issue by eliciting the perceived net wealth at the 50th and 90th percentile of the net wealth distribution. To familiarize respondents with this rather involved task, we first explain the meaning of wealth distribution, how one can partition the distribution into ten equally-sized bins, and what the median and 90th percentile is. To ease understanding, we illustrate this graphically with the help of a ladder with nine rungs that indicates the bottom 10% households, the median household, and the top 10% households. Subsequently, respondents estimate the net wealth of the median household and the top 10% household using a slider displaying values according to the function $Y = 500 * \exp^{(0.045 * steps)}$, where steps correspond to the slider range from 0 to 200. The specific questions are:

Now suppose we rank all households in Germany from lowest to highest net wealth and divide this ranking into 10 equal sections as shown on the ladder. On the ladder, the 10% poorest households would then be on the bottom rung and the 10% richest households on the top rung. The household in the middle divides the ranking into two halves, i.e. 50% of the households are richer, and 50% are poorer than the household in the middle.

3. What do you think is the net wealth of the household in the middle of the ladder?
4. You just estimated that the household in the middle of the ladder has a net wealth of [*estimated median*] € .

What do you think is the required net wealth to belong to the 10% richest households (i.e. to be on the top rung of the ladder)?

The survey concludes with a few questions on socio-economic characteristics and attitudes, including locus of control (LoC), self-esteem, and income adequacy.

Results. We discuss the results from this manipulation check in detail in Section 3 and briefly summarize them here. First, the treatment effect on the 90th income percentile carries over to perceptions about the wealth level. In columns 2–3 of Table 2, we show that treated respondents estimate a higher median and 90th percentile of the German household wealth distribution than non-treated respondents. However, the effect on the 90th percentile is significantly more pronounced, which illustrates an asymmetric shift of the perceived distribution with a larger perceived gap to the very top among treated respondents. In Appendix A.1 below, we elaborate further on the link between inequality, relative comparisons, and risk-taking.

Second, we show that treated respondents rank themselves significantly lower in the wealth distribution than non-treated respondents (Table 2, column 4). We observe a similar pattern for our qualitative measure of relative wealth (Question 1). Only about 22 percent say their wealth situation is better or much better than that of other German households compared to 30 percent in the control condition (t-test, $p < 0.01$). Therefore, the manipulation check further illustrates that the intervention affects relative wealth perceptions but not absolute wealth perceptions.

Finally, in Table A6, we show that (i) respondents find the presentation of wealth categories equally credible in both conditions, (ii) status concerns do not affect LoC, and (iii) the treatment does not affect emotional states.

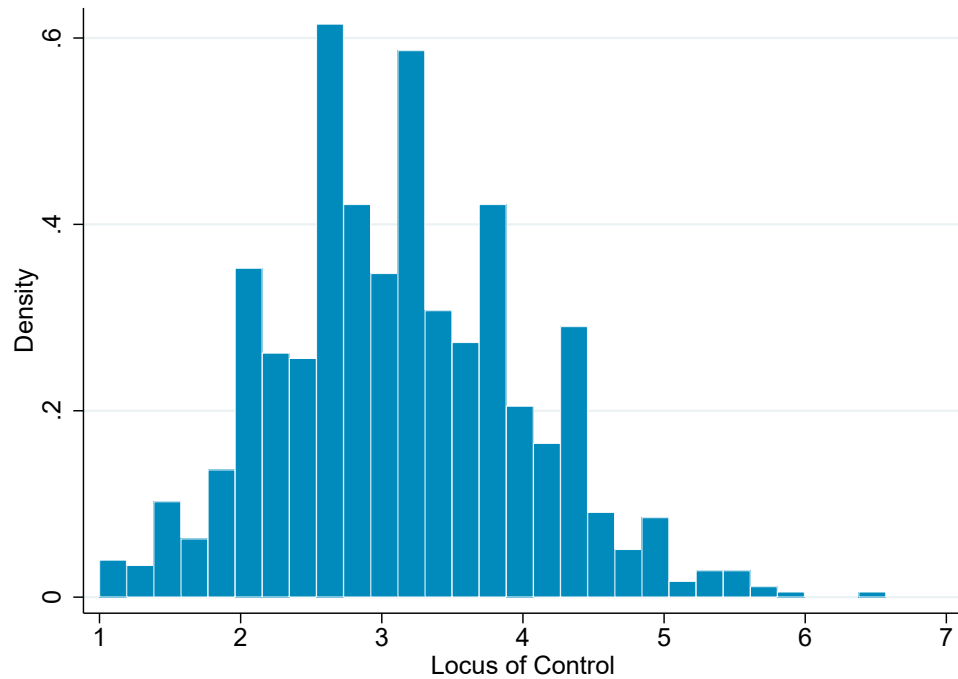
A.3 Multiple Hypothesis Test Corrections

In Table 3, we show that respondents with more external beliefs react more strongly to our treatment. To test the robustness of this result, we examine a host of other personality traits (Table A13), emotions (Table A15), and socio-economic factors (Table A16) that may potentially interact with the treatment in some meaningful way. In total, we test 15 variations of regression specification

(2). Thus, we control for multiple hypotheses testing using the false discovery rate (FDR), which is the expected proportion of falsely rejected null hypotheses among all rejected null hypotheses. Following Benjamini et al. (2006), we apply the two-stage linear step-up procedure to control for the FDR. Among the 15 hypotheses, only our main result on LoC is significant at a conventional level ($p < 0.001$, Table 3, column 4). This p-value is smaller than the threshold $q^* = 0.0031$ derived from the two-stage linear step-up procedure, the threshold of the Holm correction $\tilde{p} = 0.0033$, and the Bonferroni correction $\tilde{p} = 0.0033$. Accordingly, we can reject the null hypothesis for the interaction of LoC and treatment at conventional and adjusted p-values.

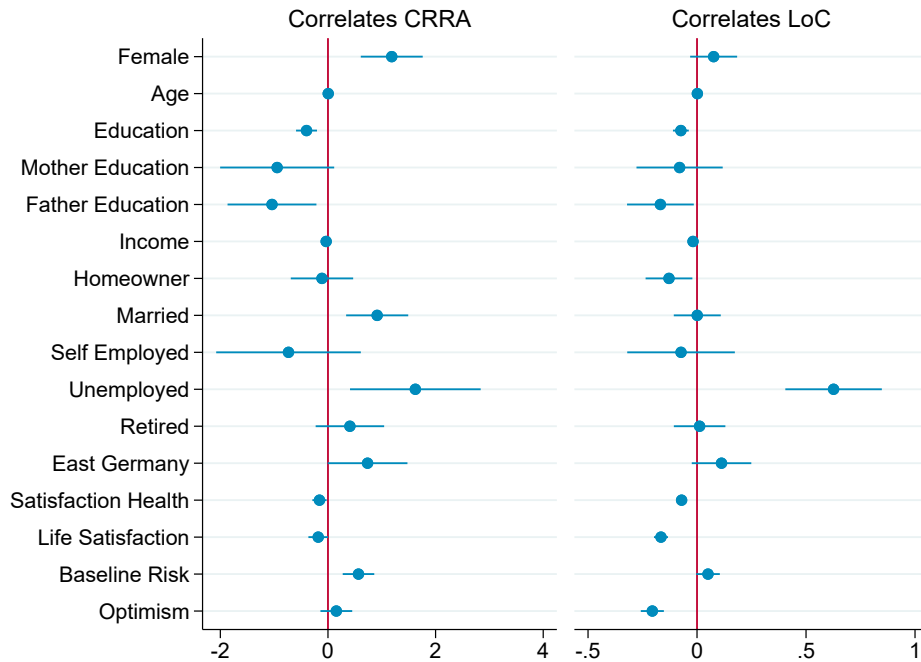
A.4 Additional Figures

Figure A1: Distribution of Locus of Control



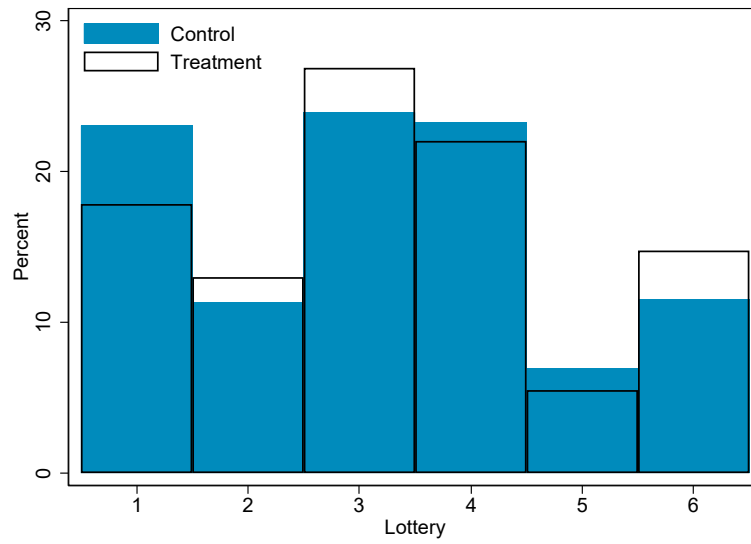
Notes: Histogram of Locus of Control based on the unweighted average of seven Locus of Control items (for more details on the constructed index, see Table A1). Higher values imply more external control beliefs. Data: SOEP-IS Sample I3.

Figure A2: Correlates of Risk and Locus of Control



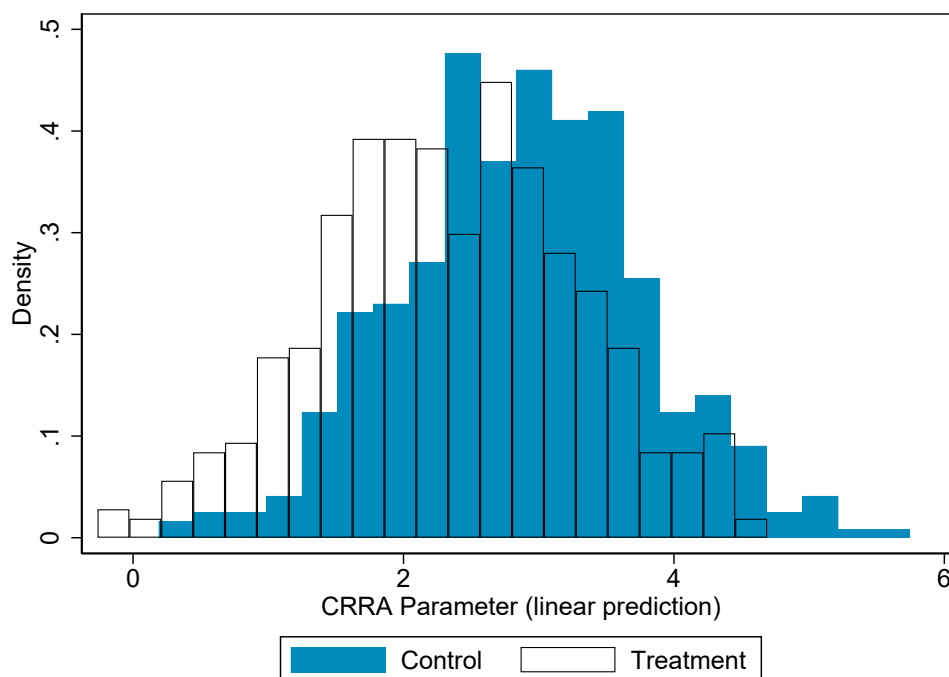
Notes: Coefficient plots from separate OLS regressions of the form $Y_i = \beta_0 + \beta_1 * Covariate + \epsilon_i$, where Y_i is either the CRRA parameter ρ (with higher values indicating less tolerance for risk) or Locus of Control (with higher values indicating more external control beliefs; see Table A1 for more details on the construction of the index). *Education* is measured in 7 categories according to the International Standard Classification of Education (ISCED), with higher categories representing a higher level of education. *Mother (Father) has Abitur* indicates a parent with qualification for university admission (Abitur is the final exam at the end of high school). *Income* is the equivalence scale determined by the square root scale (i.e., we divide the monthly household net income by the square root of the number of household members). *East Germany* is an indicator for respondents who live in East Germany. *Homeowner* identifies respondents who own their house or apartment. *Female*, *Married*, *Self-employed*, *Unemployed*, and *Retired* are indicator variables. *Satisfaction with health* is measured on a scale from 0 (completely dissatisfied) to 10 (completely satisfied). *Life Satisfaction* is measured on a scale from 0 (completely dissatisfied) to 10 (completely satisfied). *Baseline Risk* is a qualitative risk measure on a scale from 0 (very willing to take risks) to 10 (not at all willing to take risks), standardized using the sample mean and standard deviation. *Optimism* is measured on a scale from 1 (optimistic) to 4 (pessimistic) and recoded such that higher values reflect more optimism. Data: SOEP-IS Sample I3.

Figure A3: Lottery Choices by Treatment



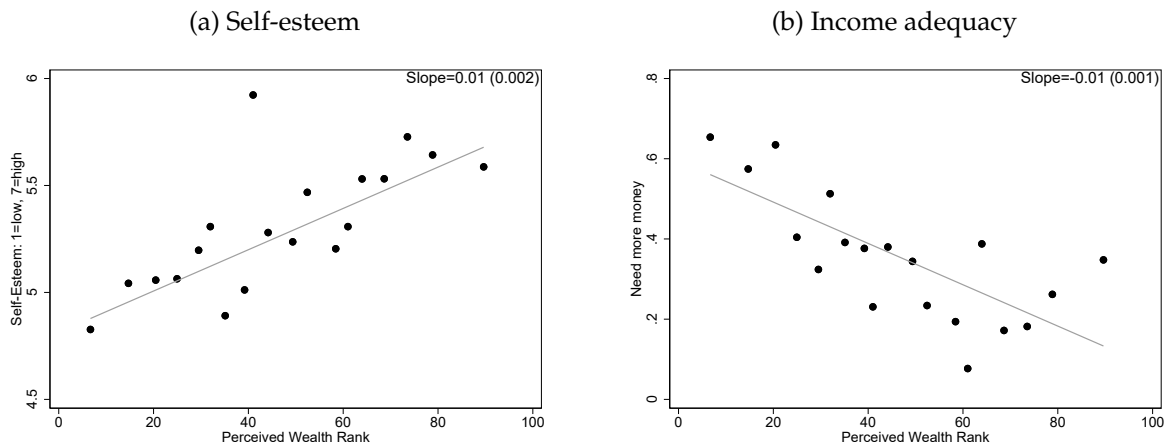
Notes: Distribution of lottery choices in the control (blue bars) and treatment condition (white bars). Lottery 1 pays €50 with equal probability (safe lottery) and subsequent lotteries become more risky with lottery 6 paying €200 and €0 with equal probability. See Table A2 for details. The propensity to choose the safe lottery (lottery 1) is lower in treatment than in the control condition ($p = 0.047$).

Figure A4: Distribution of Predicted CRRA Parameters by Treatment



Notes: Predicted CRRA parameters from interval regression regressing the CRRA parameter ρ on a treatment indicator and a set of standard covariates: age, gender, education, parents' education, equivalized net income, marital status, the number of household members, employment status (self-employed, unemployed, retired), baseline risk aversion, homeownership, satisfaction with health, and region. Lower values of ρ indicate higher tolerance for risk. Data: SOEP-IS Sample I3.

Figure A5: Perceived Relative Wealth Rank and Self Perceptions



Notes: Binned scatterplot of perceived relative wealth rank and self perceptions using data from the manipulation check ($N = 987$). Panel (a) displays the relationship between perceived relative rank and self-esteem measured by agreement with statement “*I have a positive attitude towards myself*” on a scale from 1 (disagree) to 7 (agree). Panel (b) displays the relationship with income adequacy (“*Need more money to be able to live a satisfying life – yes/no*”). Data: respondi

A.5 Additional Tables

Table A1: Locus of Control Questions

Locus of Control Module Items					
	N	Mean	S.D.	Min	Max
IT 1: <i>The course of my life is depending on me.</i>	914	5.644	1.308	1	7
IT 2: <i>In comparison to others, I have not achieved what I deserve.</i>	914	3.111	1.700	1	7
IT 3: <i>What you achieve in life, is first of all a question of fate or luck.</i>	914	3.491	1.610	1	7
IT 4: <i>I often experience that others are deciding about my life.</i>	914	2.696	1.585	1	7
IT 5: <i>You have to work hard to be successful.</i>	914	5.910	1.118	1	7
IT 6: <i>When I face difficulties in life, I often doubt my abilities.</i>	914	3.170	1.615	1	7
IT 7: <i>Which opportunities I have in life is determined by social conditions.</i>	914	4.452	1.524	1	7
IT 8: <i>More important than all effort, are the abilities you have.</i>	914	4.828	1.354	1	7
IT 9: <i>I have little control over the things happening in my life.</i>	914	2.655	1.434	1	7
IT 10: <i>Social or political involvement can influence social conditions.</i>	914	3.958	1.652	1	7
Locus of Control Index					
$LoC = (-(IT1-8)+IT2+IT3+IT4+IT6+IT7+IT9)/7$	914	3.133	0.872	1	6.571
<i>External Scale</i> (IT3, IT4, IT6, IT7, IT9)	914	3.104	0.998	1	6.592
<i>Internal Scale</i> (IT1, IT5)	914	2.223	0.935	1	5.500

Notes: Descriptive statistics for each item in the Locus of Control (LoC) module. Each item required respondents to answer on a scale from 1 (disagree completely) to 7 (Agree completely). We follow Specht et al. (2013) and the SOEP scales manual Richter et al. (2013) and combine IT 1, IT 2, IT 3, IT 4, IT 6, IT 7, IT 9 in an equally weighted LoC index as in Cobb-Clark and Schurer (2013). As a robustness check, we consider two separate indices for the items corresponding to internal and external control beliefs, respectively Caliendo et al. (2015); Pinger et al. (2018); Caliendo et al. (2022). The items are weighted according to a principal component analysis. For the regression analyses, we use standardized versions of all indices with a mean of zero and standard deviation of one. The non-standardized figures here are for illustrative purposes. Data: SOEP-IS Sample I3.

Table A2: Overview of Gambles

	Payoffs	EV	S.D.	CRRA-Interval
<i>Lottery 1</i>	(50, 50)	50	0	$[7.51, \infty)$
<i>Lottery 2</i>	(45, 95)	70	25	$[1.74, 7.51]$
<i>Lottery 3</i>	(40, 120)	80	40	$[0.812, 1.74]$
<i>Lottery 4</i>	(30, 150)	90	60	$[0.315, 0.812]$
<i>Lottery 5</i>	(10, 190)	100	90	$[0, 0.315]$
<i>Lottery 6</i>	(0, 200)	100	100	$(-\infty, 0]$

Notes: Lotteries used in the risk elicitation task. Each lottery pays a low or high payoffs (in €) with equal probability. Respondents choose one of the lotteries and for every tenth respondent the chosen lottery was realized and paid out. Assuming CRRA utility of the form $u(x) = \frac{x^{1-\rho}}{1-\rho}$, where x is the respective payoff and ρ the coefficient of interest, we can calculate lower and upper bounds for relative risk aversion for each lottery. For example, comparing the expected utility of Lottery 2 and lottery 3 gives the lower bound of ρ for lottery 2 and the upper bound of ρ for lottery 3.

Table A3: Balance

	Mean Treatment	Mean Control	p-value
Female=1	0.54	0.53	0.906
Age	48.27	46.63	0.170
Lower secondary=1	0.15	0.14	0.915
Upper secondary=1	0.63	0.64	0.743
College=1	0.23	0.22	0.772
Mother has Abitur=1	0.08	0.11	0.126
Father has Abitur=1	0.14	0.17	0.319
Income (net/month)	2075.35	2203.91	0.076
Home owner=1	0.49	0.48	0.736
Log(wealth)	10.49	10.10	0.492
Married=1	0.53	0.54	0.633
No. of HH Members	2.35	2.44	0.218
Self employed=1	0.05	0.04	0.557
Unemployed=1	0.06	0.05	0.327
Retired=1	0.29	0.26	0.199
East Germany=1	0.19	0.17	0.303
Satisfaction with Health	6.79	6.62	0.273
Life Satisfaction	7.61	7.62	0.922
Baseline Risk	5.04	5.11	0.643
<i>Prob > F</i>			0.59

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Each row presents the means of *covariate* in the treatment and control group along with the p-values from separate OLS regressions of the form $Treated = \beta_0 + \beta_1 * Covariate + \epsilon_i$. *Prob > F* is the p-value from an F-test for joint significance of all covariates. Education is measured in 7 categories according to the International Standard Classification of Education (ISCED), where *Lower secondary* corresponds to the first two categories, *Upper secondary* to categories 3, 4, and 5, and *College* to the highest category (6). *Mother (Father) has Abitur* indicates a parent with qualification for university admission (Abitur is the final exam at the end of high school). *Income* is the equivalence scale determined by the square root scale (i.e., we divide the monthly household net income by the square root of the number of household members), *Homeowner* identifies respondents who own their house or apartment, and *Log(wealth)* is the log of the estimated wealth level of the household. *Female*, *Married*, *Self-employed*, *Unemployed*, and *Retired* are indicator variables. *East Germany* is an indicator for respondents who lived in East Germany before 1990. *Satisfaction with health* is measured on a scale from 0 (completely dissatisfied) to 10 (completely satisfied). *Life Satisfaction* is measured on a scale from 0 (completely dissatisfied) to 10 (completely satisfied). *Baseline Risk* is a qualitative risk measure on a scale from 0 (very willing to take risks) to 10 (not at all willing to take risks). Data: SOEP-IS Sample I3.

Table A4: Personality Traits – Balance

	Mean Treatment	Mean Control	p-value
Openness	-0.00	0.01	0.829
Conscientiousness	-0.02	-0.01	0.892
Extraversion	0.01	0.03	0.736
Agreeableness	-0.02	-0.00	0.820
Neuroticism	0.00	0.01	0.888
Optimism	-0.01	0.05	0.343
Relative Optimism	0.01	-0.01	0.776
Locus of Control	3.10	3.17	0.257
Self Control	-0.04	-0.06	0.773
<i>Prob > F</i>			0.966

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Each row presents the means of *covariate* in the treatment and control group along with the p-values from separate OLS regressions of the form $Treated = \beta_0 + \beta_1 * Covariate + \epsilon_i$. *Prob > F* is the p-value from an F-test for joint significance of all covariates. The Big 5 consist of *Openness*, *Conscientiousness*, *Extraversion*, *Agreeableness*, and *Neuroticism*, which are standardized to a mean of zero and standard deviation of 1. *Optimism* indicates how respondents think about their future (“If you think about the future: Are you... (1) optimistic; (2) rather optimistic than pessimistic; (3) rather pessimistic than optimistic; (4) pessimistic?”). We recoded the variable such that higher values reflect more optimism. *Relative optimism* is the unweighted average of four questions for which respondents had to indicate on a scale from 1 (“Very much less likely”) to 7 (“Very much more likely”) how they judged the likelihood to: (1) be financially successful; (2) become seriously ill; (3) be successful in their job; (4) be happy in general, relative to peers of the same age and sex. *Locus of Control* (LoC) is an equally weighted index of the LoC questions with higher values corresponding to more external beliefs. *Self-Control* is a standardized (mean zero, standard deviation 1) sum of 13 self-control indicators, in the spirit of Tangney et al. (2004). Data: SOEP-IS Sample I3.

Table A5: Correlates of Lottery Choice, Risk Aversion, and Locus of Control

	Lottery Choice		CRRA Parameter		Locus of Control	
	(1)	(2)	(3)	(4)	(5)	(6)
Female	-0.450*** (0.149)	-0.332** (0.149)	1.185*** (0.415)	0.887** (0.408)	0.076 (0.078)	0.039 (0.073)
Age	0.001 (0.004)	0.005 (0.006)	0.005 (0.011)	-0.006 (0.017)	0.002 (0.002)	0.002 (0.003)
Education	0.169*** (0.050)	0.121** (0.056)	-0.399*** (0.140)	-0.318** (0.154)	-0.074*** (0.026)	-0.045 (0.028)
Mother has Abitur	0.226 (0.275)	-0.230 (0.312)	-0.944 (0.765)	0.419 (0.857)	-0.080 (0.143)	0.113 (0.154)
Father has Abitur	0.363* (0.213)	0.286 (0.235)	-1.040* (0.596)	-0.690 (0.647)	-0.168 (0.111)	-0.064 (0.116)
Income (net/month)	0.013* (0.007)	0.000 (0.008)	-0.033* (0.020)	-0.006 (0.022)	-0.018*** (0.004)	-0.011*** (0.004)
Home owner	0.111 (0.150)	0.097 (0.161)	-0.112 (0.418)	-0.191 (0.442)	-0.129* (0.078)	-0.061 (0.079)
Married	-0.173 (0.150)	-0.348** (0.160)	0.914** (0.416)	1.314*** (0.439)	0.001 (0.078)	0.149* (0.079)
Self employed	0.444 (0.343)	0.058 (0.356)	-0.733 (0.969)	0.297 (0.982)	-0.073 (0.178)	0.101 (0.175)
Unemployed	-0.761** (0.311)	-0.575* (0.337)	1.624* (0.876)	1.196 (0.930)	0.626*** (0.160)	0.262 (0.166)
Retired	-0.109 (0.164)	-0.222 (0.245)	0.408 (0.459)	0.404 (0.677)	0.012 (0.085)	-0.024 (0.120)
East Germany	-0.121 (0.190)	-0.118 (0.192)	0.736 (0.535)	0.793 (0.532)	0.112 (0.099)	0.001 (0.095)
Satisfaction with Health	0.063* (0.034)	0.022 (0.040)	-0.157* (0.095)	-0.039 (0.109)	-0.071*** (0.017)	0.004 (0.020)
Life Satisfaction	0.085* (0.047)	0.067 (0.054)	-0.181 (0.132)	-0.157 (0.149)	-0.165*** (0.023)	-0.123*** (0.027)
Baseline Risk	-0.195*** (0.075)	-0.183** (0.075)	0.567*** (0.211)	0.546*** (0.209)	0.050 (0.039)	0.028 (0.037)
Optimism	-0.058 (0.076)	-0.114 (0.079)	0.155 (0.212)	0.305 (0.217)	-0.205*** (0.038)	-0.137*** (0.039)
Observations	446		446		446	

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Dependent variables are the lottery choice in columns 1-2, the CRRA parameter ρ (with higher values indicating less tolerance for risk) in columns 3-4, and Locus of Control (with higher values indicating higher control beliefs – external LoC) in columns 5-6. Data from control group only, interval regressions in columns 3-4 and otherwise OLS regressions (with standard errors in parentheses). Odd-numbered columns display coefficients from separate regressions for each covariate, while even-numbered columns report a multivariate regression including all covariates at once. *Education* is measured in 7 categories according to the International Standard Classification of Education (ISCED), with higher categories representing a higher level of education. *Mother (Father) has Abitur* indicates a parent with qualification for university admission (Abitur is the final exam at the end of high school). *Income* is the equivalence scale determined by the square root scale (i.e., we divide the monthly household net income by the square root of the number of household members) and *Homeowner* identifies respondents who own their house or apartment. *Female*, *Married*, *Self-employed*, *Unemployed*, and *Retired* are indicator variables. *East Germany* is an indicator for respondents who live in East Germany. *Satisfaction with health* is measured on a scale from 0 (completely dissatisfied) to 10 (completely satisfied). *Life Satisfaction* is measured on a scale from 0 (completely dissatisfied) to 10 (completely satisfied). *Baseline Risk* is a qualitative risk measure on a scale from 0 (very willing to take risks) to 10 (not at all willing to take risks), standardized using the sample mean and standard deviation. *Optimism* is measured on a scale from 1 (optimistic) to 4 (pessimistic) and recoded such that higher values reflect more optimism. Data: SOEP-IS Sample I3.

Table A6: Manipulation Check: Additional Outcomes

	Credibility Data	LoC	Self-esteem	Mood	Emotional
	(1)	(2)	(3)	(4)	(5)
Treated	0.006 (0.050)	-0.059 (0.064)	0.036 (0.084)	0.553 (1.299)	-1.443 (1.270)
Control Group Mean	3.706*** (0.036)	3.258*** (0.045)	5.241*** (0.060)	63.898*** (0.913)	90.415*** (0.892)
Sample	respondi	respondi	respondi	SOEP-IS	SOEP-IS
Observations	980	980	980	914	914
R2	0.07	0.09	0.09	0.08	0.05

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. OLS regression with standard errors in parentheses. Columns (1–3) based on respondi sample (see Section A.2) and columns (4–5) based on SOEP-IS Data. “Credibility Data” measures the credibility of the data on wealth categories (“The data on wealth categories comes from the Bundesbank. How credible do you consider these data to be?”; scale: 1 – not credible to 5 – very credible), “LoC” is an index for internal and external locus of control measured on a scale from 1 (internal) to 7 (external), “Self-esteem” measures a positive self-attitude (“I have a positive attitude towards myself.”; scale: 1 – does not apply at all to 7 – does apply), and “Mood” and “Emotional” are subscales of the SF12-Health Inventory measuring mood and limitations due to emotional problems (on a scale from 0 to 100). Covariates include age, gender, education, parents’ education, equivalized net income, marital status, household size, employment status (self-employed, unemployed, retired), homeownership, and region (East/West Germany). Data: SOEP-IS Sample I3 and respondi.

Table A7: Non-participation in the survey module

Panel a.)			
Non-participation in treatment and control			
	Treatment	Control Mean	N
Non-participation	0.030 (0.023)	0.165 (0.016)	1,115
Panel b.)			
Baseline difference in risk aversion between participation and non-participation			
	Non-participation	Participation	N
Baseline Risk	-0.152 (0.185)	5.078 (0.078)	1,115
Panel c.)			
Baseline difference in risk aversion of non-participants in treatment and control			
	Treatment	Control	N
Baseline Risk	0.004 (0.328)	4.923 (0.242)	201

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. OLS regressions with standard errors in parentheses. Panel a) reports the difference in the likelihood of non-participation in treatment versus control (column Treatment) from regressing an indicator for non-participation on a treatment indicator. Panel b) reports the difference in baseline risk aversion between participating and non-participating respondents from regressing baseline risk aversion on an indicator of non-participation. Panel c) displays the difference in baseline risk aversion of non-participating respondents in treatment versus control (column Treatment) from regressing baseline risk aversion on a treatment indicator using non-participating respondents only. *Baseline Risk* is measured prior to the treatment on a scale from very willing to take risks (0) to not very willing to take risks (10). Data: SOEP-IS Sample I3.

Table A8: Results for Inverse Probability Re-Weighting

	CRRA Parameter							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treated	-0.560* (0.290)	-0.602** (0.284)	-0.570** (0.290)	-0.592** (0.284)	-0.594** (0.285)	-0.596** (0.286)	-0.602** (0.287)	-0.602** (0.289)
Treated x LoC			-0.895*** (0.300)	-0.939*** (0.297)	-0.909*** (0.297)	-0.943*** (0.296)	-0.926*** (0.304)	-0.897*** (0.303)
LoC			0.583** (0.227)	0.372 (0.235)	0.310 (0.239)	0.382 (0.236)	0.393 (0.248)	0.325 (0.248)
Covariates	No	Yes	No	Yes	Yes	Yes	Yes	Yes
Big 5	No	No	No	No	Yes	No	No	Yes
Optimism	No	No	No	No	No	Yes	No	Yes
Self-Control	No	No	No	No	No	No	Yes	Yes
Observations	914	914	914	914	914	914	879	879
Log-Likelihood	-2476.81	-2451.99	-2470.69	-2444.97	-2442.00	-2444.88	-2345.60	-2341.58

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Interval regressions with standard errors in parentheses. Observations weighted by the inverse of the probability that they are part of our study sample. The propensity scores stem from a probit regression of an indicator for respondents in the study sample on the following covariates: age, equivalized net income, education, household size, satisfaction with health, life satisfaction, wealth and indicators for gender, marital status, employment status (self-employed, retired, unemployed), region (East/West Germany), homeownership, qualification for university (Abitur) of mother and father, and baseline risk aversion. Big 5 consist of *Openness*, *Conscientiousness*, *Extraversion*, *Agreeableness*, and *Neuroticism*, which are standardized to a mean of zero and standard deviation of 1. *Optimism* indicates how respondents think about their future ("If you think about the future: Are you... (1) optimistic; (2) rather optimistic than pessimistic; (3) rather pessimistic than optimistic; (4) pessimistic?"). We recoded the variable, such that higher values reflect more optimism. *Self-Control* is the standardized sum of 13 self-control items, following Tangney et al. (2004). Higher values imply more indicated self-control. Data: SOEP-IS Sample I3.

Table A9: Treatment Effect on the Propensity to Choose the Safe Lottery Option

	Full Sample	Above Median LOC (External)	Below Median LOC (Internal)
	(1)	(2)	(3)
Treated	-0.053** (0.027)	-0.138*** (0.038)	0.025 (0.038)
Constant	0.171* (0.103)	0.083 (0.136)	0.260 (0.164)
Observations	914	452	462
R^2	0.04	0.08	0.05

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. OLS regressions with robust standard errors in parentheses. The dependent variable is an indicator for choosing lottery 1 (sure pay-off of 50€), instead of any other lottery option (see Table A2). Column (1) uses the full sample for the estimation, column (2) limits the sample to individuals with above median locus of control (externals), and column (3) restricts the sample to those with below median locus of control values (internals). Covariates include age, equivalized net income, education, household size, satisfaction with health, life satisfaction, and indicators for gender, marital status, employment status (self-employed, retired, unemployed), region (East/West Germany), homeownership, qualification for university (Abitur) of mother and father, and baseline risk aversion. Data: SOEP-IS Sample I3.

Table A10: Main Treatment Effects – Interval Midpoint

	CRRA Parameter (midpoint)					
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	-0.486* (0.279)	-0.498* (0.278)	-0.491* (0.278)	-0.501* (0.278)	-0.508* (0.283)	-0.498* (0.283)
Treated x LoC	-0.929*** (0.280)	-0.953*** (0.278)	-0.940*** (0.279)	-0.956*** (0.278)	-0.950*** (0.284)	-0.940*** (0.286)
LoC	0.561*** (0.206)	0.385* (0.213)	0.310 (0.218)	0.392* (0.214)	0.400* (0.225)	0.321 (0.228)
Covariates	No	Yes	Yes	Yes	Yes	Yes
Big 5	No	No	Yes	No	No	Yes
Optimism	No	No	No	Yes	No	Yes
Self-Control	No	No	No	No	Yes	Yes
Observations	914	914	914	914	879	879

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. OLS regressions with standard errors in parentheses. Dependent variable is the midpoint of CRRA intervals (see Table A2, for the left- and right-censored interval, we use the upper and lower bound). Lower values indicate higher tolerance for risk. *LoC* is the z-score of a single index for locus of control, constructed as detailed in Table A1. Higher values correspond to more external beliefs. Covariates include: age, gender, education, parents' education, equivalized net income, marital status, household size, employment status (self-employed, unemployed, retired), baseline risk aversion, homeownership, satisfaction with health, and region (East/West Germany). *Big 5s* consist of *Openness*, *Conscientiousness*, *Extraversion*, *Agreeableness*, and *Neuroticism*, which are standardized to a mean of zero and standard deviation of 1. *Optimism* indicates how respondents think about their future ("If you think about the future: Are you... (1) optimistic; (2) rather optimistic than pessimistic; (3) rather pessimistic than optimistic; (4) pessimistic?"). We recoded the variable such that higher values reflect more optimism. *Self-Control* is the standardized sum of 13 self-control items, following Tangney et al. (2004). Higher values imply more indicated self-control. Data: SOEP-IS Sample I3.

Table A11: Heterogeneous Effects – Separate Internal and External LoC

	CRRRA Parameter					
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	-0.523* (0.281)	-0.553** (0.277)	-0.550** (0.276)	-0.555** (0.277)	-0.549* (0.281)	-0.544* (0.280)
Treated x External Scale	-0.790*** (0.287)	-0.818*** (0.281)	-0.793*** (0.282)	-0.820*** (0.282)	-0.853*** (0.286)	-0.833*** (0.286)
External Scale	0.535*** (0.207)	0.311 (0.209)	0.236 (0.216)	0.315 (0.210)	0.351 (0.222)	0.272 (0.226)
Treated x Internal Scale	-0.279 (0.285)	-0.253 (0.281)	-0.270 (0.281)	-0.253 (0.281)	-0.045 (0.289)	-0.050 (0.289)
Internal Scale	-0.025 (0.204)	-0.007 (0.206)	0.021 (0.207)	-0.005 (0.206)	-0.105 (0.211)	-0.077 (0.212)
Covariates	No	Yes	Yes	Yes	Yes	Yes
Big 5	No	No	Yes	No	No	Yes
Optimism	No	No	No	Yes	No	Yes
Self-Control	No	No	No	No	Yes	Yes
Observations	914	914	914	914	879	879
Log-Likelihood	-2071.57	-2049.45	-2047.29	-2049.42	-1972.80	-1969.92

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Interval regressions with standard errors in parentheses. Dependent variable is the CRRRA parameter ρ (with lower values indicating higher tolerance for risk). External and internal scale constructed as in Table A1. Both are standardized z-scores. Covariates include: age, gender, education, parents' education, equivalized net income, marital status, household size, employment status (self-employed, unemployed, retired), baseline risk aversion, homeownership, satisfaction with health, and region (East/West Germany). *Big 5s* consist of *Openness*, *Conscientiousness*, *Extraversion*, *Agreeableness*, and *Neuroticism*, which are standardized to a mean of zero and standard deviation of 1. *Optimism* indicates how respondents think about their future ("If you think about the future: Are you... (1) optimistic; (2) rather optimistic than pessimistic; (3) rather pessimistic than optimistic; (4) pessimistic?"). We recoded the variable such that higher values reflect more optimism. *Self-Control* is the standardized sum of 13 self-control items, following Tangney et al. (2004). Higher values imply more indicated self-control. Data: SOEP-IS Sample I3.

Table A12: Heterogeneous Effects - Locus of Control & Other Personality Traits

	CRRRA Parameter					
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	-0.525* (0.282)	-0.551** (0.277)	-0.551** (0.277)	-0.554** (0.277)	-0.555** (0.281)	-0.552** (0.281)
Treated x LoC	-0.917*** (0.284)	-0.952*** (0.278)	-0.928*** (0.279)	-0.955*** (0.278)	-0.937*** (0.283)	-0.916*** (0.284)
LoC	0.589*** (0.209)	0.385* (0.213)	0.330 (0.218)	0.393* (0.215)	0.409* (0.224)	0.346 (0.227)
Covariates	No	Yes	Yes	Yes	Yes	Yes
Big 5	No	No	Yes	No	No	Yes
Optimism	No	No	No	Yes	No	Yes
Self-Control	No	No	No	No	Yes	Yes
Observations	914	914	914	914	879	879
Log-Likelihood	-2071.99	-2049.49	-2047.34	-2049.43	-1972.53	-1969.60

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Interval regressions with standard errors in parentheses. Dependent variable is the CRRRA parameter ρ (with lower values indicating higher tolerance for risk). *LoC* is the z-score of a single index for locus of control, constructed as detailed in Table A1. Higher values correspond to more external beliefs. Covariates include: age, gender, education, parents' education, equivalized net income, marital status, household size, employment status (self-employed, unemployed, retired), baseline risk aversion, homeownership, satisfaction with health, life satisfaction, region (East/West Germany), and baseline risk aversion. *Big 5* consist of *Openness*, *Conscientiousness*, *Extraversion*, *Agreeableness*, and *Neuroticism*, which are standardized to a mean of zero and standard deviation of 1. *Optimism* indicates how respondents think about their future ("If you think about the future: Are you... (1) optimistic; (2) rather optimistic than pessimistic; (3) rather pessimistic than optimistic; (4) pessimistic?"). We recoded the variable, such that higher values reflect more optimism. *Self-Control* is the standardized sum of 13 self-control items, following Tangney et al. (2004). Higher values imply more indicated self-control. Data: SOEP-IS Sample I3.

Table A13: Heterogeneous Effects – Other Personality Traits

	CRRRA Parameter					
	(1)	(2)	(3)	(4)	(5)	(7)
Neuroticism	Agreeableness	Extraversion	Openness	Conscientiousness	Optimism	Self-Control
Treated	-0.561** (0.278)	-0.571** (0.279)	-0.563** (0.279)	-0.564** (0.278)	-0.562** (0.279)	-0.559** (0.282)
Interaction Effect	-0.119 (0.280)	0.048 (0.278)	0.059 (0.283)	0.307 (0.282)	0.078 (0.278)	-0.300 (0.284)
Level Effect	0.309 (0.200)	0.150 (0.199)	-0.038 (0.211)	-0.115 (0.206)	0.043 (0.203)	0.191 (0.206)
Observations	914	914	914	914	914	879
Log-Likelihood	-2054.04	-2054.89	-2055.62	-2055.01	-2055.43	-1978.04

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Interval regressions with standard errors in parentheses. Dependent variable is the CRRRA parameter ρ (with lower values indicating higher tolerance for risk). “Interaction Effect” is the interaction between Treated and the corresponding personality trait indicated on top of a column, while “Level Effect” corresponds to the association between personality trait and dependent variable. All personality traits are standardized to have a mean of zero and standard deviation of one. Columns 1-5 show the *Big 5* traits and columns 6-7 indicate *Optimism* and *Self-Control* measures. *Optimism* indicates how respondents think about their future (“If you think about the future: Are you... (1) optimistic; (2) rather optimistic than pessimistic; (3) rather pessimistic than optimistic; (4) pessimistic?”). We recoded the variable, such that higher values reflect more optimism. *Self-Control* is the standardized sum of 13 self-control items, following Tangney et al. (2004). Higher values imply more indicated self-control. Data: SOEP-IS Sample I3.

Table A14: Heterogeneous Effects - Locus of Control & Emotions

	CRRA Parameter					
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	-0.525* (0.282)	-0.551** (0.277)	-0.561** (0.277)	-0.549** (0.277)	-0.551** (0.277)	-0.563** (0.276)
Treated x LoC	-0.917*** (0.284)	-0.952*** (0.278)	-0.946*** (0.278)	-0.947*** (0.278)	-0.950*** (0.278)	-0.937*** (0.277)
LoC	0.589*** (0.209)	0.385* (0.213)	0.415* (0.214)	0.348 (0.214)	0.391* (0.215)	0.388* (0.215)
Covariates	No	Yes	Yes	Yes	Yes	Yes
Happiness Index	No	No	Yes	No	No	Yes
Anger	No	No	No	Yes	No	Yes
Fear	No	No	No	No	Yes	Yes
Observations	914	914	914	914	914	914
Log-Likelihood	-2071.99	-2049.49	-2048.63	-2047.42	-2049.47	-2045.55

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Interval regressions with standard errors in parentheses. Dependent variable is the CRRA parameter ρ (with lower values indicating higher tolerance for risk). *LoC* is the z-score of a single index for locus of control, constructed as detailed in Table A1. Higher values correspond to more external beliefs. Covariates include: age, gender, education, parents' education, equivalized net income, marital status, household size, employment status (self-employed, unemployed, retired), baseline risk aversion, homeownership, satisfaction with health, life satisfaction, and region (East/West Germany). *Emotions* indicate the frequency of feeling *happy*, *sad*, *angry*, and *fearful* in the last four weeks and is measured on a scale from very rarely (1) to very often (5). *Happiness Index* is an unweighted index of happiness and sadness computed as $(happiness - sadness)/2 + 3$ to equal the range of the other emotions (Anger and Fear). Data: SOEP-IS Sample I3.

Table A15: Heterogeneous Effects - Emotions

	CRRRA Parameter		
	(1) Happiness Index	(2) Anger	(3) Fear
Treated	-2.698* (1.405)	-0.567 (0.822)	-0.882 (0.622)
Interaction Effect	0.589 (0.372)	0.013 (0.283)	0.196 (0.304)
Level Effect	-0.249 (0.257)	0.348* (0.193)	0.031 (0.222)
Observations	914	914	914
Log-Likelihood	-2076.16	-2074.26	-2076.82

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Interval regressions with standard errors in parentheses. Dependent variable is the CRRRA parameter ρ (with lower values indicating higher tolerance for risk). "Interaction Effect" is the interaction between Treated and the corresponding emotion indicated on top of a column, while "Level Effect" corresponds to the association between emotion and dependent variable. *Emotions* indicate the frequency of feeling *happy, sad, angry, and fearful* in the last four weeks and is measured on a scale from very rarely (1) to very often (5). *Happiness Index* is an unweighted index of happiness and sadness computed as $(happiness - sadness)/2 + 3$ to equal the range of the other emotions (Anger and Fear). Data: SOEP-IS Sample I3.

Table A16: Heterogeneous Effects - Socio-economic Characteristics

	CRRRA Parameter			
	(1) Female	(2) Unemployed	(3) Income	(4) Education
Treated	-0.297 (0.411)	-0.456 (0.290)	-3.731 (4.370)	-0.989 (0.755)
Interaction Effect	-0.416 (0.563)	-0.834 (1.270)	0.430 (0.577)	0.127 (0.191)
Level Effect	1.166*** (0.397)	1.588* (0.836)	-0.741* (0.402)	-0.391*** (0.134)
Observations	914	914	914	914
Log-Likelihood	-2071.37	-2075.30	-2075.44	-2071.30

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Interval regressions with standard errors in parentheses. Dependent variable is the CRRRA parameter ρ (with lower values indicating higher tolerance for risk). "Interaction Effect" is the interaction between Treated and the corresponding emotion indicated on top of a column, while "Level Effect" corresponds to the association between emotion and dependent variable. *Female* and *Unemployment* are indicators for gender and employment status. *Income* is the equivalence scale determined by the square root scale (i.e., we divide the monthly household net income by the square root of the number of household members). *Education* is measured in 7 categories according to the International Standard Classification of Education (ISCED), with higher categories representing a higher level of education. Data: SOEP-IS Sample I3.

Table A17: Inequality and Locus of Control

	Risk Aversion			
	(1)	(2)	(3)	(4)
Inequality: Gini	-1.185** (0.456)	-0.756* (0.431)	-0.169 (0.364)	-0.275 (0.367)
Inequality x LoC	-0.482** (0.200)	-0.322** (0.160)	-0.295*** (0.110)	-0.278** (0.118)
LoC	0.253*** (0.075)	0.161*** (0.060)	0.164*** (0.043)	0.157*** (0.046)
Constant	0.447** (0.171)	-0.264 (0.233)	-0.286* (0.145)	-0.323** (0.132)
Individual Covariates	No	Yes	Yes	Yes
Region FE	No	No	Yes	Yes
Survey Year FE	No	No	No	Yes
Observations	145,206	130,068	130,068	130,068
Countries	71	70	70	70
R ²	0.02	0.09	0.11	0.12

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. OLS regressions on the relationship between income inequality and risk aversion using data from the *World Value Survey*. Standard errors, clustered at the country level, in parentheses. The dependent variable is Schwartz's risk sensation seeking measure. Higher values imply higher risk aversion. Inequality measured by the national-level Gini coefficient, after tax and transfers. Higher values imply higher inequality (Scale: 0 to 1). Locus of Control (LoC) is proxied by the standardized answers to the question: "Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them. Indicate how much freedom of choice and control you feel you have over the way your life turns out (Scale from 1 – "a great deal" – to 10 – "none at all")." *Individual covariates* include marital status, number children, subjective health status, satisfaction with financial situation of household, gender, age, education, and employment status. *Region FE* include the Arab World/Maghreb states, Latin Europe, post-Soviet countries, Eastern Europe, Nordic/Germanic countries, Latin American, South/East Asia, and Sub-Saharan Africa. The reference category is Anglo-Saxon countries. *Survey Year FE* is an indicator for wave 5 (base is wave 6). Data: World Values Survey: wave 5 and 6.

Table A18: Wealth Categories by Condition – Manipulation Check

Control Group	Treatment Group
Up to 3,000€	Up to 334,000€
3,001€ to 11,800€	334,001€ to 555,400€
11,801€ to 31,200€	555,401€ to 861,600€
31,201€ to 131,000€	861,601€ to 1,292,100€
More than 131,000€	More than 1,292,100€

Notes: Wealth categories used in the control and treatment condition. Upper bounds taken from 2017 Household Finance and Consumption Survey (HFCS, Deutsche Bundesbank, 2019).

A.6 Survey Module – SOEP-IS

Our survey module consists of three parts: questions on personality traits, the treatment manipulation, and a lottery task to measure risk preferences. In what follows, we list the English wording of each question (translated from German).

Optimism. We measure optimism with two questions: a general question about optimism regarding the future taken from the SOEP, and a question about the likelihood of experiencing an event relative to an average person:

1. *When you think about the future: are you... [Scale: (i) ...optimistic, (ii) ...rather optimistic than pessimistic, (iii) ...rather pessimistic than optimistic, (iv) ...pessimistic?]*
2. *Compared to other people of the same age and gender as you: how likely is it that throughout your life you will...*
 - *...be financially successful?*
 - *...not suffer from a serious illness?*
 - *...be successful in your job?*
 - *...be satisfied overall?*

For each component subjects could answer on a scale from 1 to 7, where 1 implies very much less likely, 4 implies as likely as the average person, and 7 implies very much more likely.

Locus of Control. We implemented the same ten items that are routinely used in the SOEP (Nolte et al., 1997). respondents answered on a Likert-scale ranging from 1 (disagree completely) to 7 (agree completely):

The following statements capture different attitudes towards life and the future. To which degree do you personally agree with the statements?

- (i) *The course of my life is depending on me.*
- (ii) *In comparison to others, I have not achieved what I deserve.*
- (iii) *What you achieve in life, is first of all a question of fate or luck.*
- (iv) *I often experience that others are deciding about my life.*

- (v) *You have to work hard to be successful.*
- (vi) *When I face difficulties in life, I often doubt my abilities.*
- (vii) *Which opportunities I have in life is determined by social conditions.*
- (viii) *More important than all effort, are the abilities you have.*
- (ix) *I have little control over the things happening in my life.*
- (x) *Social or political involvement can influence social conditions.*

Treatment Manipulation. Our treatment manipulation is embedded in a question about respondent's wealth. Specifically, we ask respondents to indicate their net wealth using five predefined wealth categories. To manipulate respondents' perception regarding the distribution of wealth, we randomly vary the available categories. That is, we assign half of the respondents to categories with relatively wide intervals (treatment group), while the other half of respondents is assigned to much smaller intervals (control group):

Now I would like to talk with you about wealth. One can divide households in Germany into five categories of wealth. Wealth in this context refers to net wealth. That is, it is equivalent to total household wealth including cash, savings accounts, stocks and real estate, minus debts, such as loans, mortgages, or credit card debt. Please indicate to which category your household belongs:

- (i) *Up to €2,500 (**Treatment Group:** Up to €275,000)*
- (ii) *€2,501 to €11,000 (€275,001 to €468,000)*
- (iii) *€11,001 to €27,000 (€468,001 to €722,000)*
- (iv) *€27,001 to €112,000 (€722,001 to €989,000)*
- (v) *More than €112,001 (More than €989,001)*

Risk Elicitation. In the risk elicitation part respondents faced two questions. The first question asked them to indicate whether they would like to participate in a lottery game, whereas the second contained the actual lottery choice:

Now let us turn to a special task with which we try to understand how people make financial decisions. We will present you with six lotteries. We ask you to choose one of the six lotteries. At the end of

*this block of questions every 10th respondent will be randomly chosen to actually receive the winnings from their chosen lottery. The actual payment will be made at the end of the complete questionnaire. [Answers: (1) start the lottery game, (2) I do not want to participate because...*open].*

I will now show you six different lotteries on the screen. Each lottery consists of two pay-offs, each of which can be drawn with equal probability. The lotteries differ in the sense that for each lottery you have an equal chance of winning different amounts of money. At the end of this module we will determine whether your choice will actually be paid out to you. Which lottery do you choose?

- (i) Lottery 1: 50% 50€ / 50% 50€
- (ii) Lottery 2: 50% 45€ / 50% 95€
- (iii) Lottery 3: 50% 40€ / 50% 120€
- (iv) Lottery 4: 50% 30€ / 50% 150€
- (v) Lottery 5: 50% 10€ / 50% 190€
- (vi) Lottery 6: 50% 0€ / 50% 200€

Top-10% income threshold. *In your estimation, what gross annual income do you need to be in the top 10 percent of German households?*